SONY

HD ELECTRONIC VIEWFINDER

HDVF-150

HDVS

OPERATION AND MAINTENANCE MANUAL

1st Edition (Revised 1)

Serial No. 10001 and Higher

For the customers in the USA

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

For the customers in Canada

This apparatus complies with the Class A limits for radio noise emissions set out in Radio Interference Regulations.

Pour les utilisateurs au Canada

Cet appareil est conforme aux normes Classe A pour bruits radioélectriques, spécifiés dans le Règlement sur le brouillage radioélectrique.

Bescheinigung des Herstellers

Hiermit wird bescheinigt, daß der elektronische Sucher HDVF-150 in Übereinstimmung mit den Bestimmungen derBMPT-Amtsblatt Vfg 243/1991, Vfg 46/1992 funkentstört ist, Der vorschriftsmäßige Betrieb mancher Geräte (z.B. Meßsender) kann allerdings gewissen Einschränkungen unterliegen. Beachten Sie deshalb die Hinweise in der Bedienungsanleitung.

Dem Bundesamt für Zulassungen in der Telekommunikation wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

Name und Anschrift des Herstellers/Importeurs: Sony Deutschland GmbH
Hugo Eckener Str. 20
D-5000 Köln 30

Hinweis

Gamäß der Amtsblätter des BMPT Nrn. 61/1991 und 6/1992 wird der Betreiber darauf aufmerksam gemacht, daß die von ihm mit diesem Gerät zusammengestellte Anlage auch den technischen Bestimmungen dieser Amtsblätter genügen muß.

SAFETY RELATED COMPONENT WARNING

Components identified by shading and ⚠ marked on the schematic diagrams and parts list are critical to safe operation. Replace these components with SONY parts whose part numbers appear as shown in this manual or in supplements published by SONY.

X-RAY RADIATION WARNING

Be sure that parts replacement in the high voltage block and adjustments made to the high voltage circuits are carried out precisely in accordance with the procedures given in this manual.

目　次

TABLE OF CONTENTS

第1章　取り扱い操作

1-1　概要 ……1-1(J)

1-2　各部の名称と働き ……1-2(J)

1-3　カメラへの取り付けかた ……1-5(J)

　1-3-1　取り付けかた……1-5(J)

　1-3-2　カメラへの取り付け例 ……1-9(J)

1-4　使いかた……1-11(J)

　1-4-1　視度調整 ……1-11(J)

　1-4-2　角度の調整 ……1-12(J)

　1-4-3　画面の調整 ……1-13(J)

1-5　仕様……1-14(J)

Section 1 OPERATION

1-1 Overview ..... 1-1(E)
1-2 Location and Function of Parts and Controls ..... 1-2(E)
1-3 Attaching to the Video Camera ..... 1-5(E)
  1-3-1 Attaching ..... 1-5(E)
  1-3-2 Attachment Examples ..... 1-9(E)
1-4 Operation ..... 1-11(E)
  1-4-1 Adjusting the Diopter ..... 1-11(E)
  1-4-2 Adjusting the Angle ..... 1-12(E)
  1-4-3 Adjusting the Viewfinder Screen ..... 1-13(E)
1-5 Specifications ..... 1-14(E)

2. 設置

2-1. 開梱と再梱包 …… 2-1 (J)
2-2. 標準付属品 …… 2-2 (J)
2-3. 適合コネクタ／ケーブル …… 2-2 (J)
2-3-1. コネクタの入出力信号 …… 2-2 (J)
2-4. システム接続例 …… 2-3 (J)

3. 点検および保守

3-1. 基板配置図 …… 3-1 (J)
3-2. CRT およびDEFLECTION YOKE の交換方法 …… 3-2 (J)
3-3. 点検および保守上の注意事項 …… 3-5 (J)
3-3-1. 補修用部品注意事項 …… 3-5 (J)
3-3-2. 点検および保守上の注意事項 …… 3-5 (J)
3-4. 治工具 …… 3-5 (J)

4. 調整要項

4-1. 使用機器 …… 4-1 (J)
4-2. 調整前の準備 …… 4-2 (J)
4-2-1. 調整前の注意 …… 4-2 (J)
4-2-2. 接続 …… 4-2 (J)
4-2-3. VF COVERの取り外し …… 4-3 (J)
4-3. 初期設定 …… 4-3 (J)
4-4. 調整 …… 4-4 (J)
4-4-1. 垂直ホールド調整 …… 4-4 (J)
4-4-2. 水平ホールド調整 …… 4-5 (J)
4-4-3. フライバックパルス幅調整 …… 4-6 (J)
4-4-4. 偏向ヨーク傾き調整 …… 4-7 (J)
4-4-5. VF画枠調整 …… 4-8 (J)
4-4-6. フォーカス調整 …… 4-9 (J)
4-4-7. ブライトセット調整 …… 4-10 (J)

2. INSTALLATION

2-1. Unpacking and Repacking …… 2-1 (E)
2-2. Supplied Accessories …… 2-2 (E)
2-3. Connectors/Cable …… 2-2 (E)
2-3-1. Connector Input/Output Signals …… 2-2 (E)
2-4. System Configuration …… 2-3 (E)

3. MAINTENANCE

3-1. Board Layout …… 3-1 (E)
3-2. Replacement of CRT and Deflection Yoke … 3-2 (E)
3-3. Precautions on Maintenance …… 3-5 (E)
3-3-1. Precaution on Replacement Parts …… 3-5 (E)
3-2-2. Precaution on Maintenance …… 3-5 (E)
3-4. Tools and Fixtures …… 3-5 (E)

4. ALIGNMENT

4-1. Equipment Required …… 4-1 (E)
4-2. Preparation Before Adjustment …… 4-2 (E)
4-2-1. Notes Before Adjustment …… 4-2 (E)
4-2-2. Connections …… 4-2 (E)
4-2-3. Removal of VF Cover …… 4-3 (E)
4-3. Initial Setting …… 4-3 (E)
4-4. Adjustment …… 4-4 (E)
4-4-1. V Hold Adjustment …… 4-4 (E)
4-4-2. H Hold Adjustment …… 4-5 (E)
4-4-3. Flyback Pulse Width Adjustment …… 4-6 (E)
4-4-4. Deflection Yoke Tilt Adjustment …… 4-7 (E)
4-4-5. VF Picture Frame Adjustment …… 4-8 (E)
4-4-6. Focus Adjustment …… 4-9 (E)
4-4-7. Bright Set Adjustment …… 4-10 (E)

A. BLOCK DIAGRAM

OVERALL BLOCK …… A-1

B. SEMICONDUCTOR PIN ASSIGNMENTS

C. SCHEMATIC DIAGRAM AND BOARD ILLUSTRATIONS

FRAME …… C-2
VF-46
VF-47
LP-61

D. SPARE PARTS

PARTS INFORMATION …… D-1
EXPLODED VIEW …… D-2
ELECTRICAL PARTS …… D-4

第1章　取り扱い操作

1-1 概要

本機は、ソニーの高精細度ビデオシステムHDVS（High Definition Video System）のカメラ用1.5インチ白黒ビューファインダーです。

省エネルギー設計

電源電圧の許容範囲が広く、しかも低消費電力です。

高解像度

高性能ブラウン管を採用し、水平解像度450本以上という高い解像度を達成しています。

安定した画像

高圧安定回路により、画面の明るさに関係なく、ひずみの少ない安定した画像が得られます。

連続可変ピーキング補正

連続可変のピーキング補正回路により、シャープな画像が得られ、カメラのピント合わせが容易です。

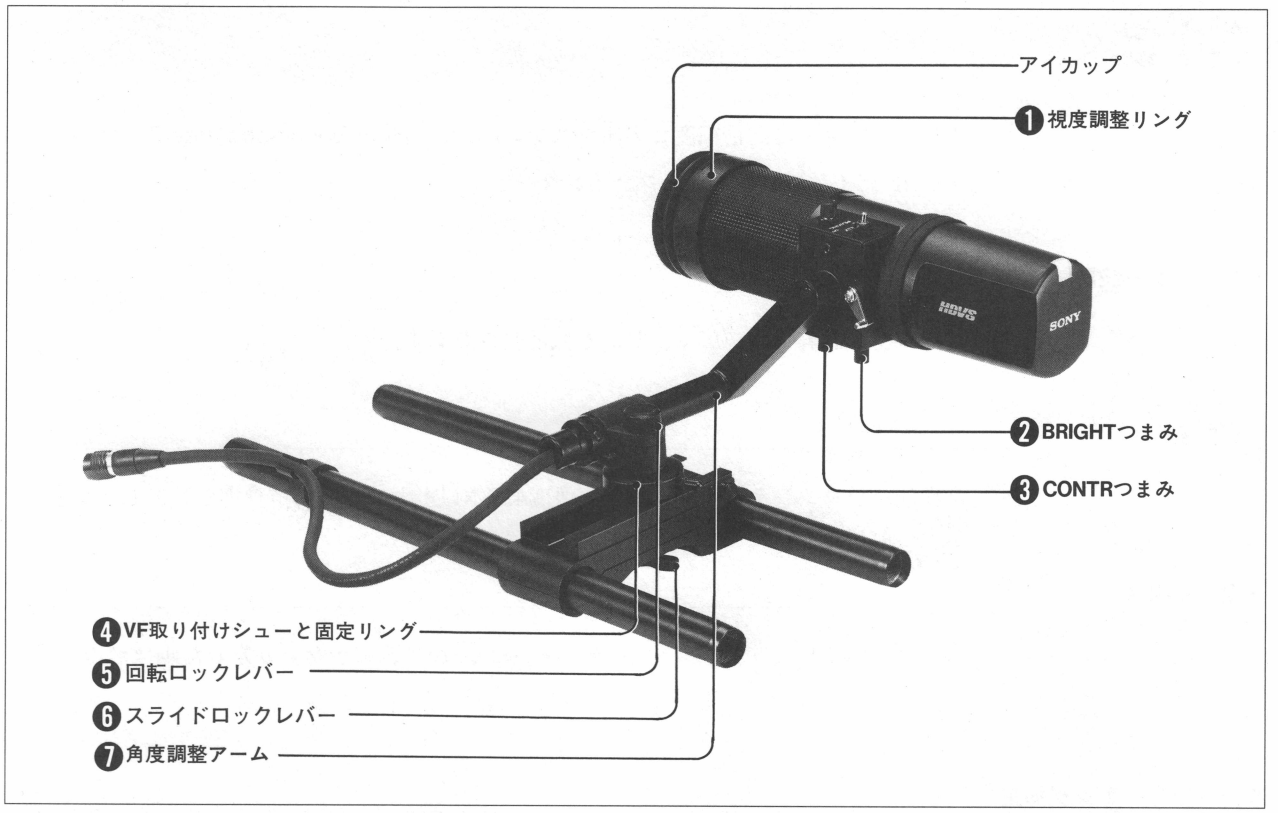
タリーランプ

タリー信号によって点灯する2系統のタリーランプを備えています。

防滴構造

戸外での撮影にも適しています。

1-2 各部の名称と働き



❶ 視度調整リング

ビューファインダー画像が最も鮮明に見えるように、リングを回してカメラマンの視度に合わせて調整します。調整範囲は+0.5～-2.0ディオプターです。

❷ BRIGHT（明るさ）つまみ

画面の明るさ（輝度）を調整します。

❸ CONTR（コントラスト）つまみ

画面コントラストを調整します。

❹ VF取り付けシューと固定リング

本機をカメラに取り付けるときに使います。

カメラ側のスライドユニットのシューに差し込み、固定リングを回してロック(固定)します。

❺ 回転ロックレバー

角度調整アームをロックします。

❻ スライドロックレバー

ビューファインダー全体の前後位置調整用のロックレバーです。

❼ 角度調整アーム

本機を見やすい角度に調整します。

❶ PEAKING（ピーキング）つまみ

画像の輪郭を補正します。右へ回すと補正量が多くなります。調整可能範囲は0dBから12dBです。

❷ TALLY ON/OFF（タリーオン／オフ）スイッチ

ONにすると外部タリーランプ❸が働きます。OFFにすると、外部タリーランプは働かなくなり、カメラにレッドタリー信号が供給されても点灯しません。

❸ 外部タリーランプ

ビューファインダー内の赤のTALLYランプと同様に働きます。点灯させたくないときは、TALLYスイッチ❷をOFFにします。

❹ 多回転防止用固定ピン

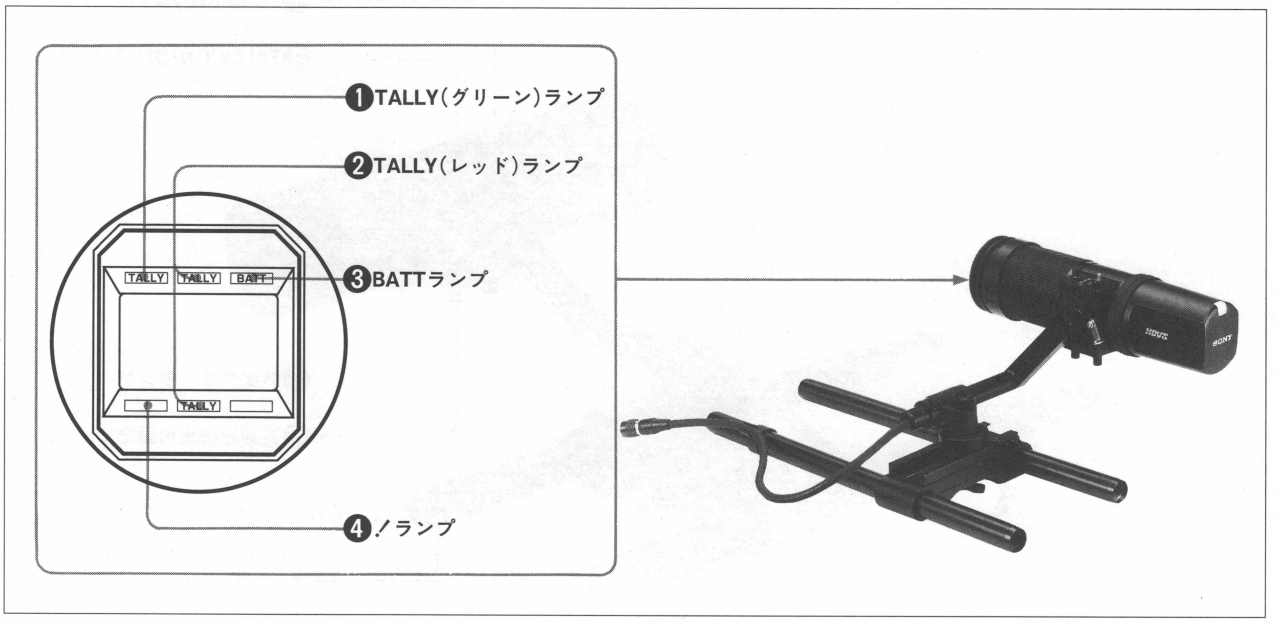
アームに対して本体が約400°以上回転しないしないための回転防止ストッパーです。

❺ 接続ケーブルとコネクター

カメラのVF端子に接続します。

PEAKINGつまみ、BRIGHTつまみ、CONTRつまみの調整は、カメラの映像出力には影響しません。

ビューファインダー内の表示



❶ TALLY(グリーン)ランプ

カメラにグリーンタリー信号が供給されると点灯します。

❷ TALLY(レッド)ランプ

カメラにレッドタリー信号が供給されると点灯します。

❸ BATT(バッテリー)ランプ

カメラまたはVTRの電池が消耗して、操作不可能になる数分前になると点滅します。操作不可能になるまで消耗すると点灯します。

❹ /(動作表示)ランプ

次の場合に点灯して、カメラの動作状態を知らせます。

- ビデオ信号のゲインアップ
- レンズのエクステンダーオン
- シャッターオン
- スーパーEVSオン
- フレーム読み出しオン

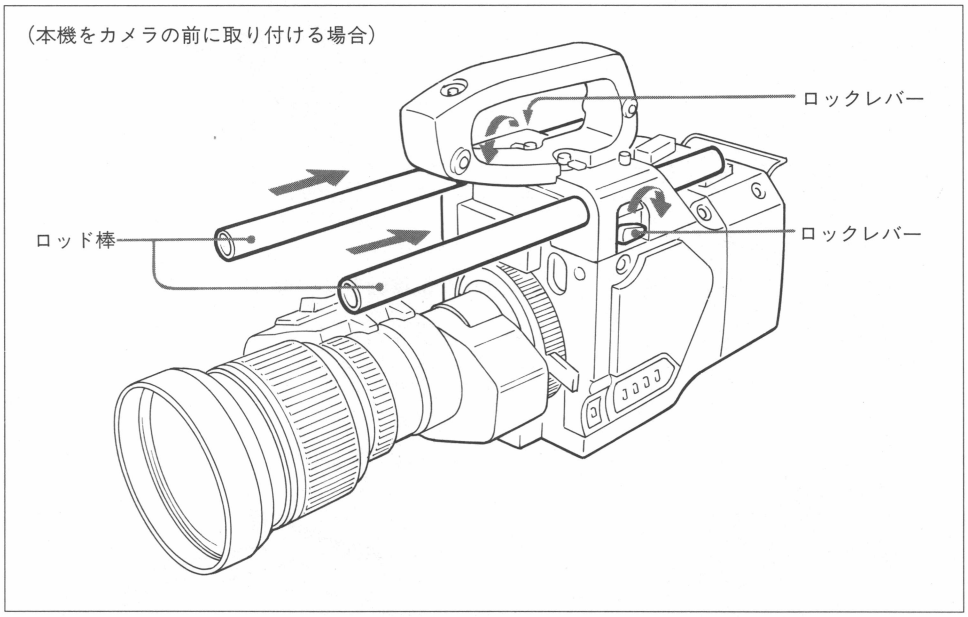
1-3 カメラへの取り付けかた

本機をカメラに付属のロッド棒を使ってカメラの前または後に取り付けます。カメラの使用状況に応じて、使いやすいほうに取り付けてください。

1-3-1 取り付けかた

カメラを取り付けるには、以下のように操作します。
取り付け場所については、「1-3-2 カメラの取り付け例」を参考にし、カメラの使用状況に合わせて決めてください。

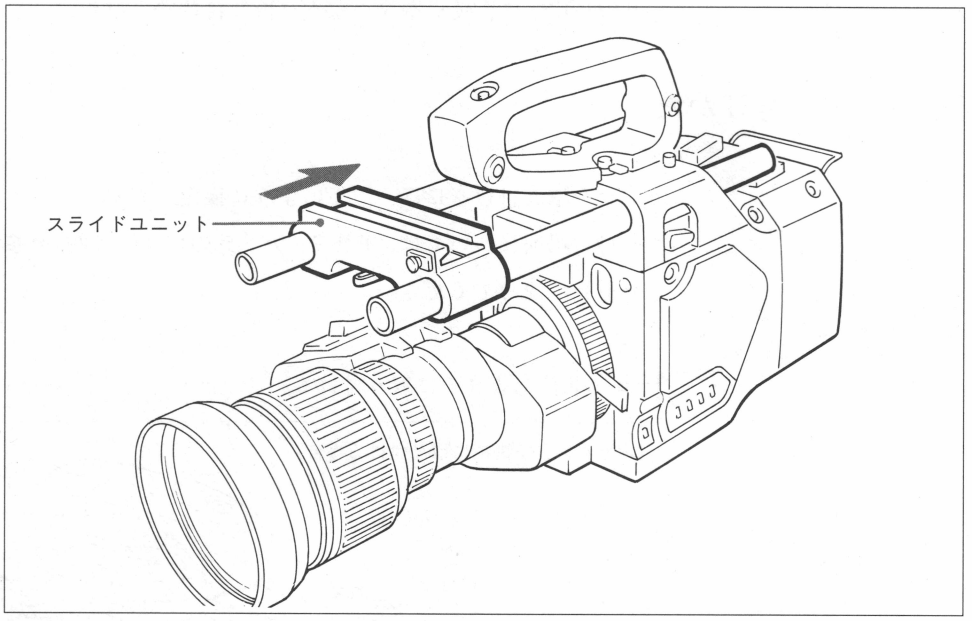
1 ロッド棒をカメラに取り付ける。



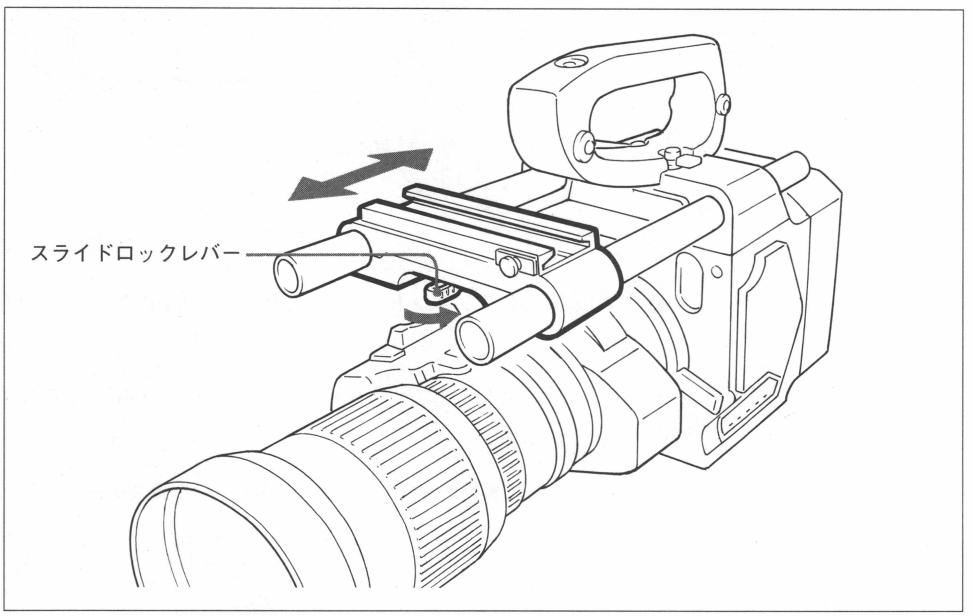
使用状況に応じて、ロッド棒の本機取り付け側をカメラの前または後ろに、もっていきます。
ロッド棒の取り付け位置が決まったら、カメラの両側にあるロックレバーを回してロッド棒を固定します。

◆ロッド棒の取り付けかたについては、システムの取扱説明書をご覧ください。

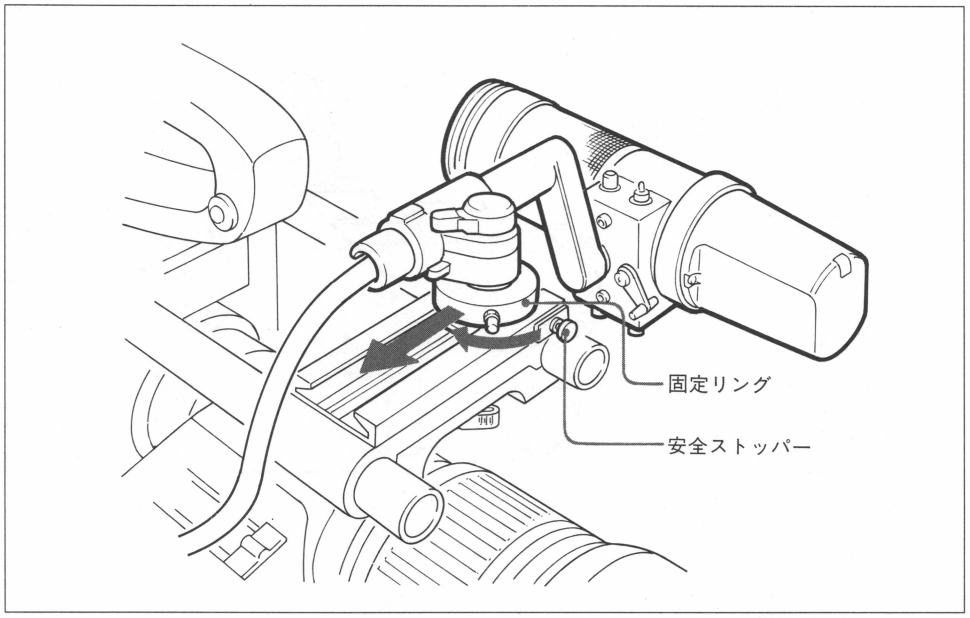
2 本機に付属のスライドユニットをロッド棒に差し込む。



3 スライドユニットを移動させ、取り付け位置が決まったらユニットの裏側にあるスライドロックレバーでスライドユニットを固定する。



4 本機のVF取り付けシューを、スライドユニットに差し込む。VF取り付けシューの位置が決まったら固定リングを回して固定する。スライドユニットの安全ストッパーが働いて、VF取り付けシューが抜けないようになっています。

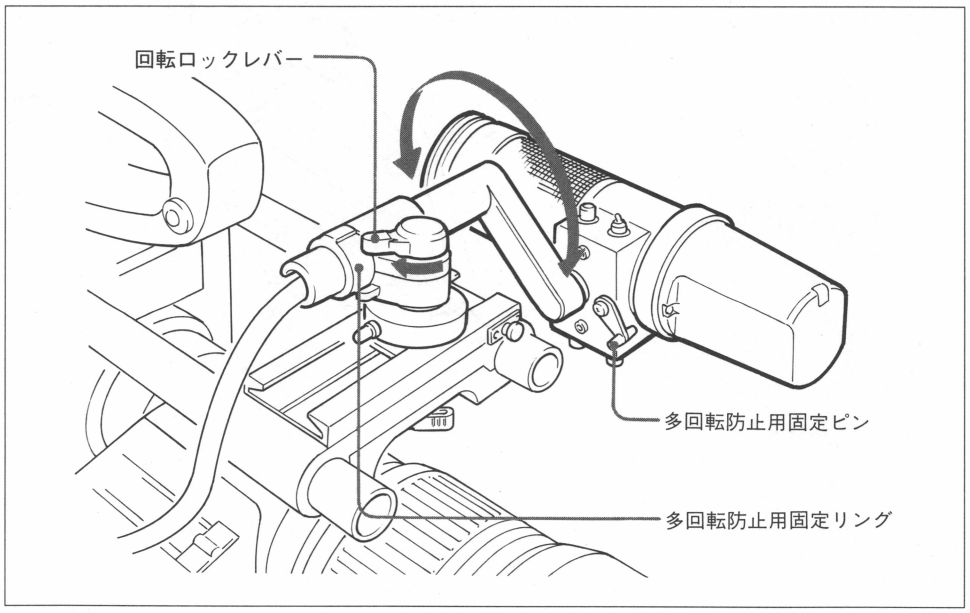


5 ビューファインダーの位置を決め、回転ロックレバーを回して固定する。
回転ロックレバーで、角度調整アームの動き具合を調整することができます。

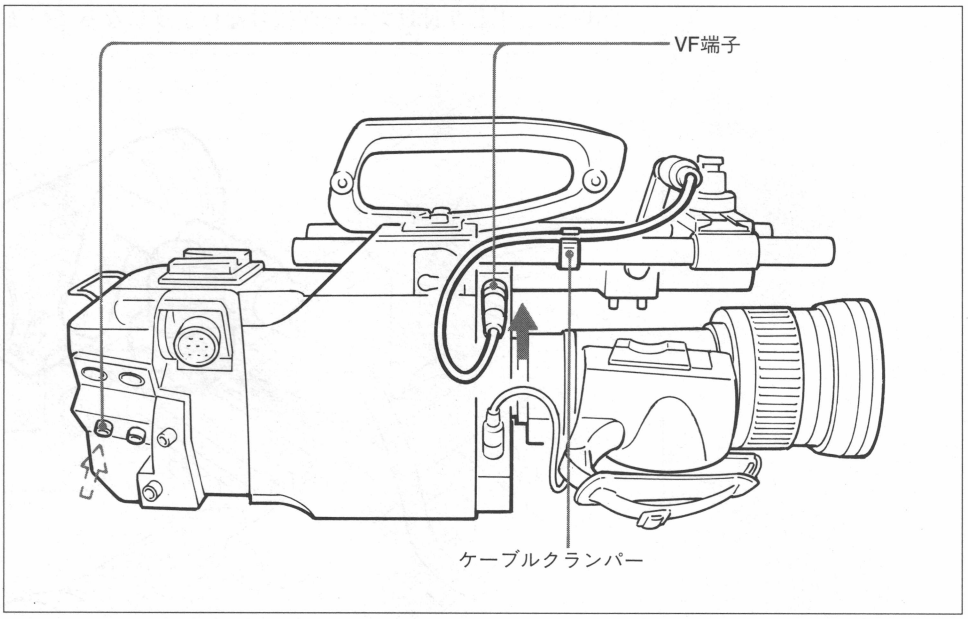
◆詳しくは「1-4-2　角度の調整」(1-12(J)ページ) をご覧ください。

ご注意

ビューファインダーは約400°回転します。多回転防止用固定ピンがついていますが、無理に回さないでください。

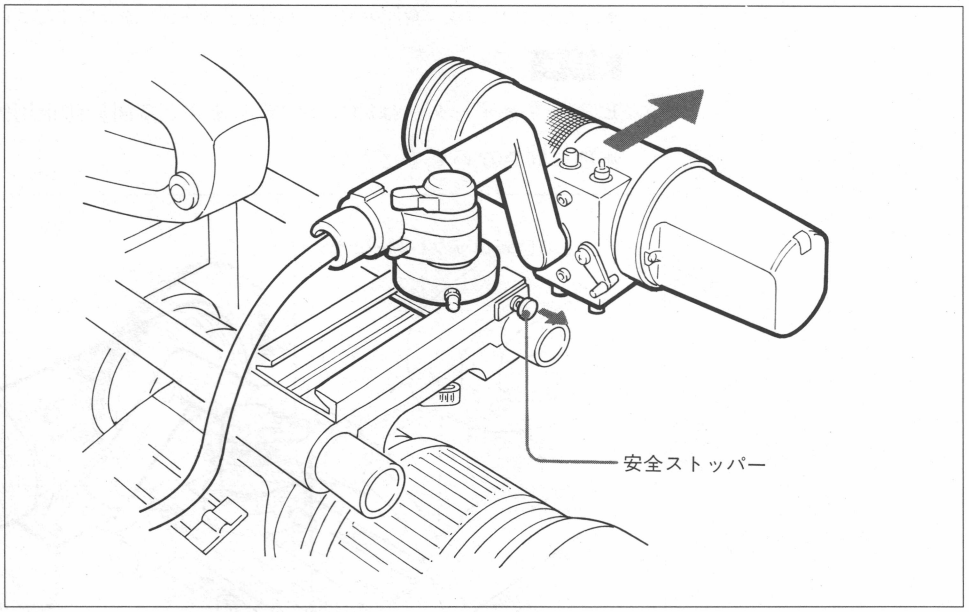


6 接続ケーブルのコネクターを、2つあるカメラのVF端子のどちらかに接続する。
接続ケーブルは、ケーブルクランパーでロッド棒に固定します。



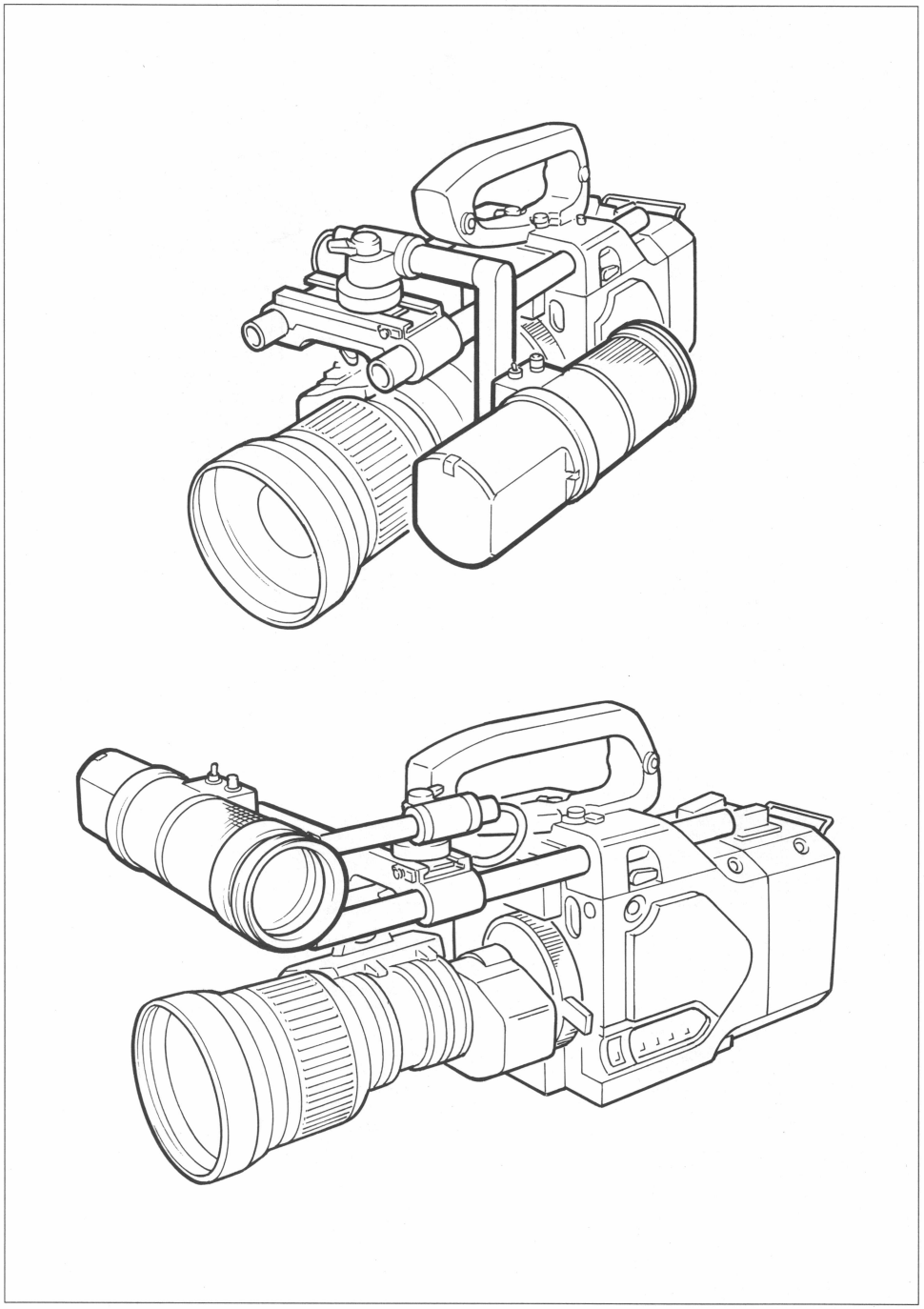
スライドユニットからビューファインダーを取り外すには

VF取り付けシューを固定しているロックレバーを回して緩めます。次にスライドユニットのストッパーを引きながら、取り外します。

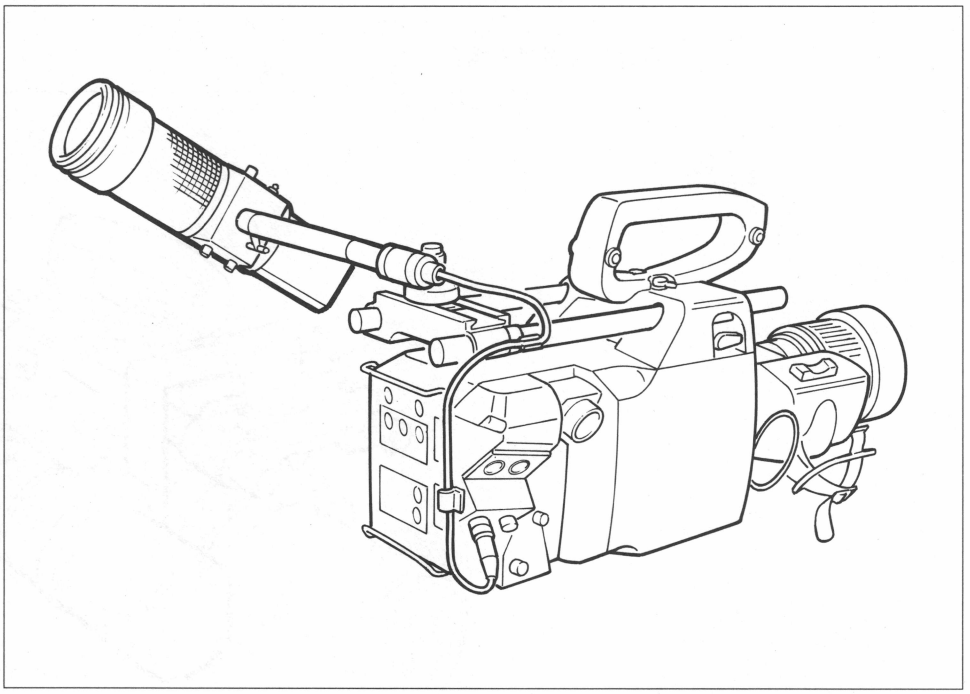


1-3-2 カメラへの取り付け例

前に取り付ける場合



後ろに取り付ける場合



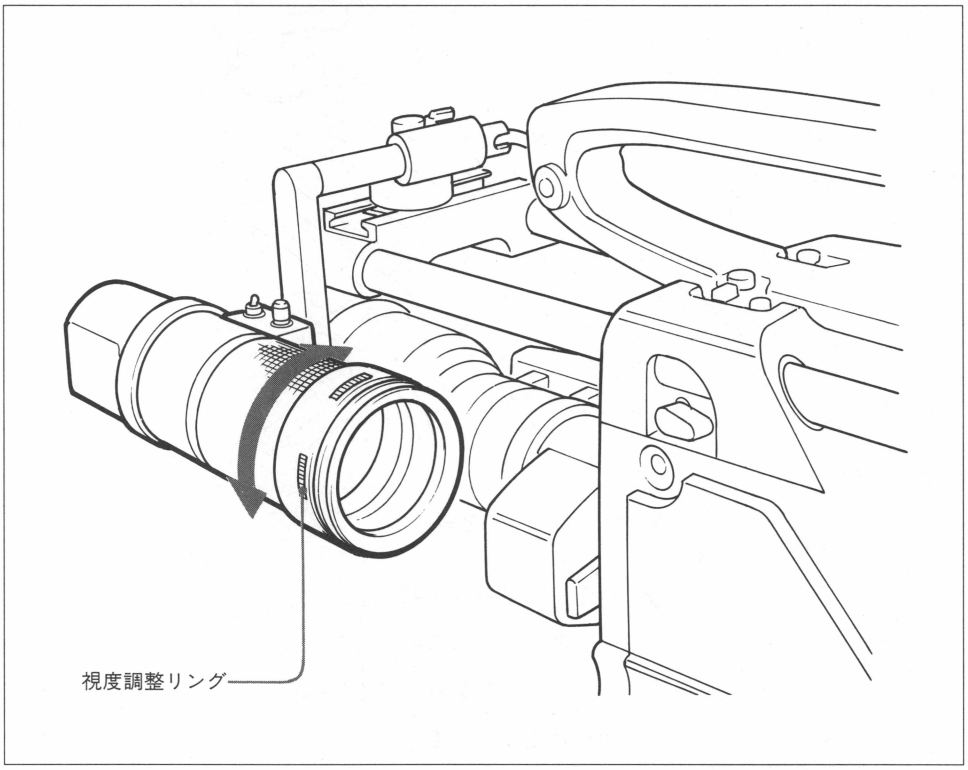
1-4 使いかた

カメラの電源を入れると、ビューファインダーにも電源が供給され、カメラの画像が映ります。記録を始める前に、次の調整を行います。

- 視度調整
- 角度の調整
- 画面の調整

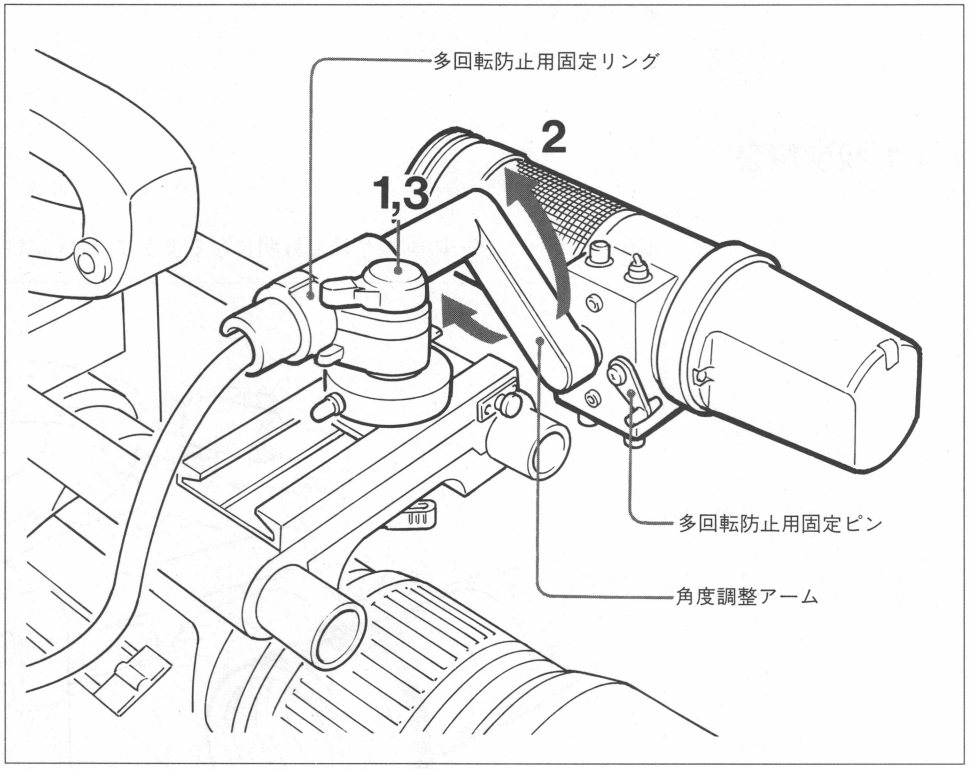
1-4-1 視度調整

ビューファインダーの画像が最も鮮明になるように、視度調整リングを回して調整します。



1-4-2 角度の調整

画面が最も見やすい位置にくるように、角度調整アームを動かして角度を調整します。



1 ロックレバーを緩める。

2 角度調整アームを動かし、最も見やすい位置にする。

角度調整アームの動き具合いは、ロックレバーで調整できます。動かしにくいときは、ロックレバーを緩めてください。

回転角度について

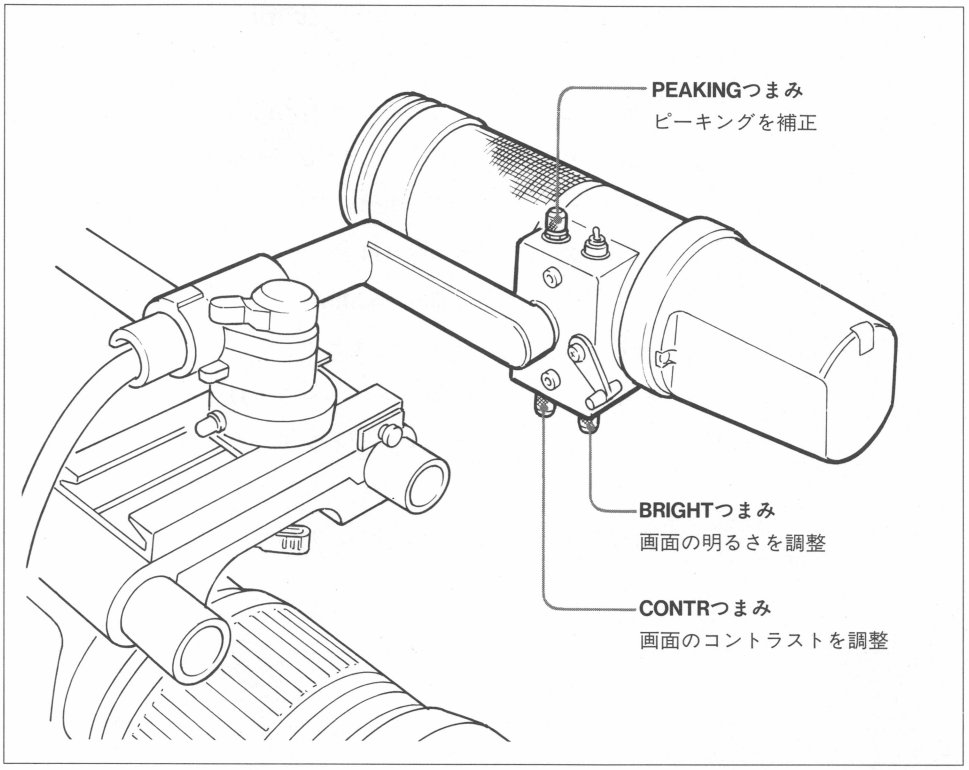
ビューファインダー本体はアームに対して、約400°回転させることができます。多回転防止用固定ピンがありますので回転はとまりますが無理に回さないでください。

角度調整アームも約400°回転させることができます。多回転防止用固定リングがついていますが無理に回さないでください。

3 ロックレバーを締め、アームを固定する。

1-4-3 画面の調整

BRIGHTつまみ、CONTRつまみ、PEAKINGつまみで、見やすい画面になるように調整します。



1-5 仕様

ブラウン管	36度偏向　1.5型モノクローム
有効画面	28×15.8mm（16:9）
輝度	350FL　MAX
解像度	水平450本以上
高圧電圧	6.5±0.3KV（標準）
入力電圧	DC10.5V～17V
ビデオ入力	2.0Vp-p、正負3値同期
周波数特性	100Hz～20MHz（±3dB）
ピーキング	0dB～12dB（8MHz）
消費電力	5.5W（最大）
外形寸法	ϕ60×230mm
重量	0.8Kg　スライドユニット（0.15Kg）含まず
付属品	スライドユニット（1） オペレーションアンドメンテナンスマニュアル（1式）

本機の仕様および外観は、改良のため予告なく変更することがありますが、ご了承ください。

Section 1 OPERATION

1-1 Overview

The HDVF-150 is a 1.5-inch monochrome electronic viewfinder designed to be mounted on the Sony High Definition Video System (HDVS) color video camera.

Low power consumption

Wide voltage range and low power consumption.

High-resolution picture

This viewfinder has a high-resolution picture tube. Horizontal resolution is more than 450 lines.

Stable pictures

The highly efficient high-voltage regulation circuit helps to stabilize pictures independent to the picture contrast.

Continuously variable peaking compensation

The continuously variable peaking compensation circuit helps to provide sharp pictures and makes it easier to focus the camera.

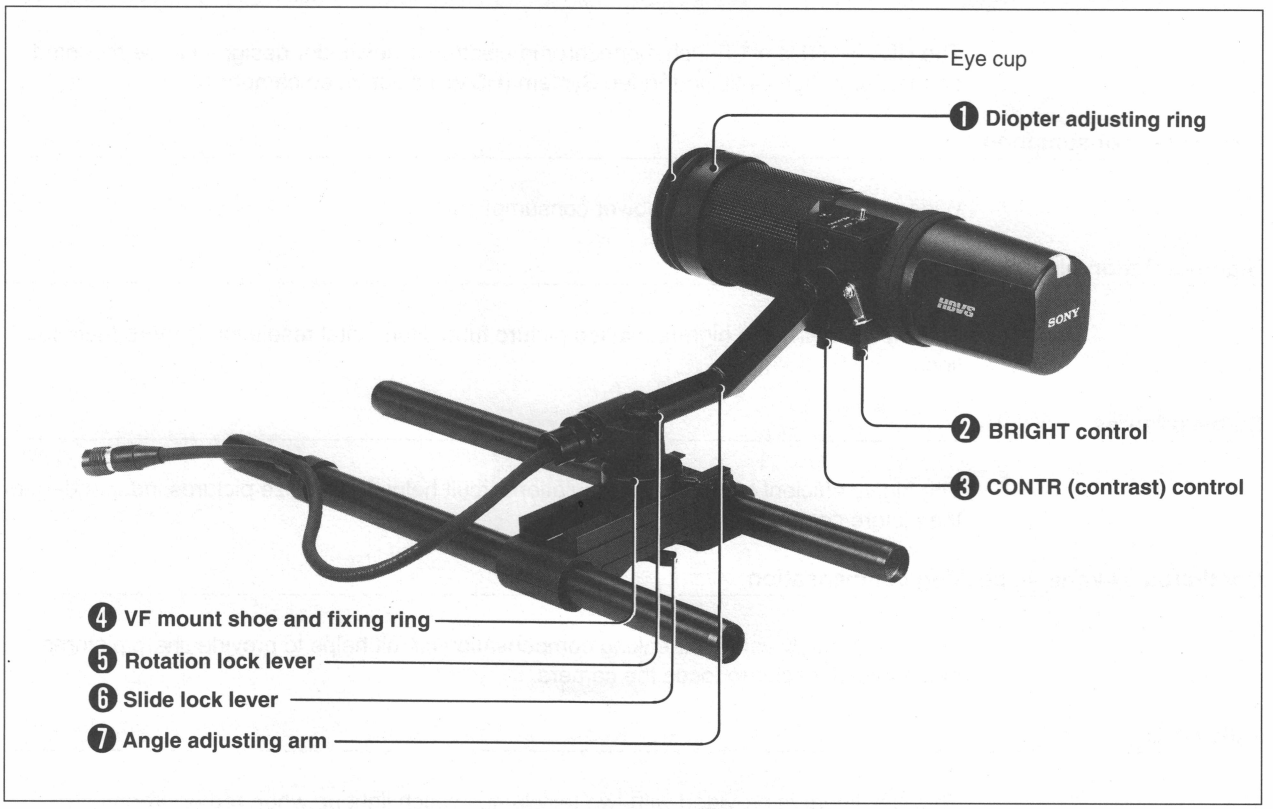
Tally lamp

This viewfinder is provided with two tally lamps which light up when red or green tally signal has been received.

Water-resistant

The protective outer structure enables you to shoot outdoors.

1-2 Location and Function of Parts and Controls



❶ Diopter adjusting ring
Adjusts depending upon the diopter so that the picture on the viewfinder screen can be seen clearly. The range can be adjusted between +0.5 to –2.0 diopters.

❷ BRIGHT control
Adjusts the picture brightness.

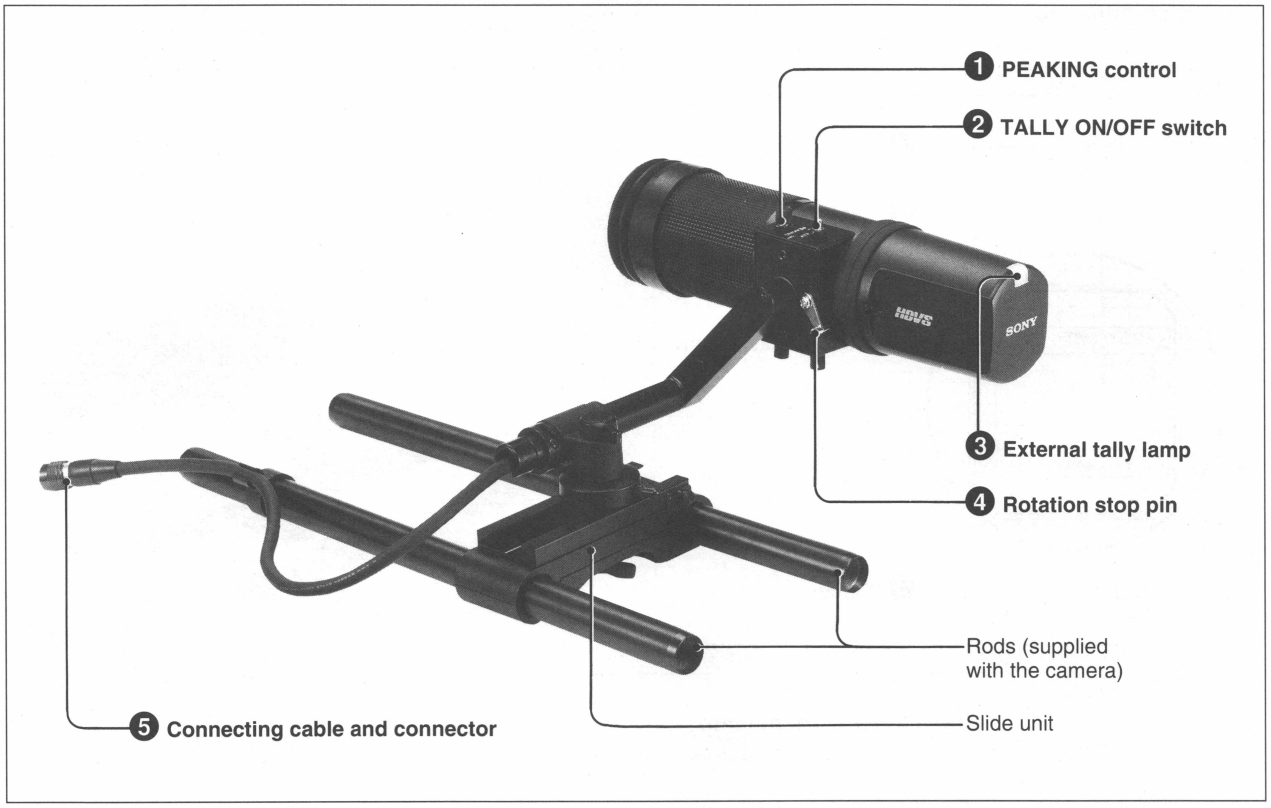
❸ CONTR (contrast) control
Adjusts the picture contrast.

❹ VF mount shoe and fixing ring
Used to attach the unit to the camera. Attach the unit to the shoe of the slide unit of the camera, then turn the fixing ring to lock it.

❺ Rotation lock lever
Locks the angle adjusting arm.

❻ Slide lock lever
Locks the slide unit which slides the viewfinder back and forth.

❼ Angle adjusting arm
Positions the unit such that the screen can be easily seen.



1 PEAKING control
Used for aperture correction. Turn the control clockwise to increase the correction value. The correction value can be set to between 0 dB and 12 dB.

2 TALLY ON/OFF switch
When set to ON, the external tally lamp 3 will light. When set to OFF, the external tally lamp will not light, such that even when the red tally signal is sent to the camera, the tally lamp will not light.

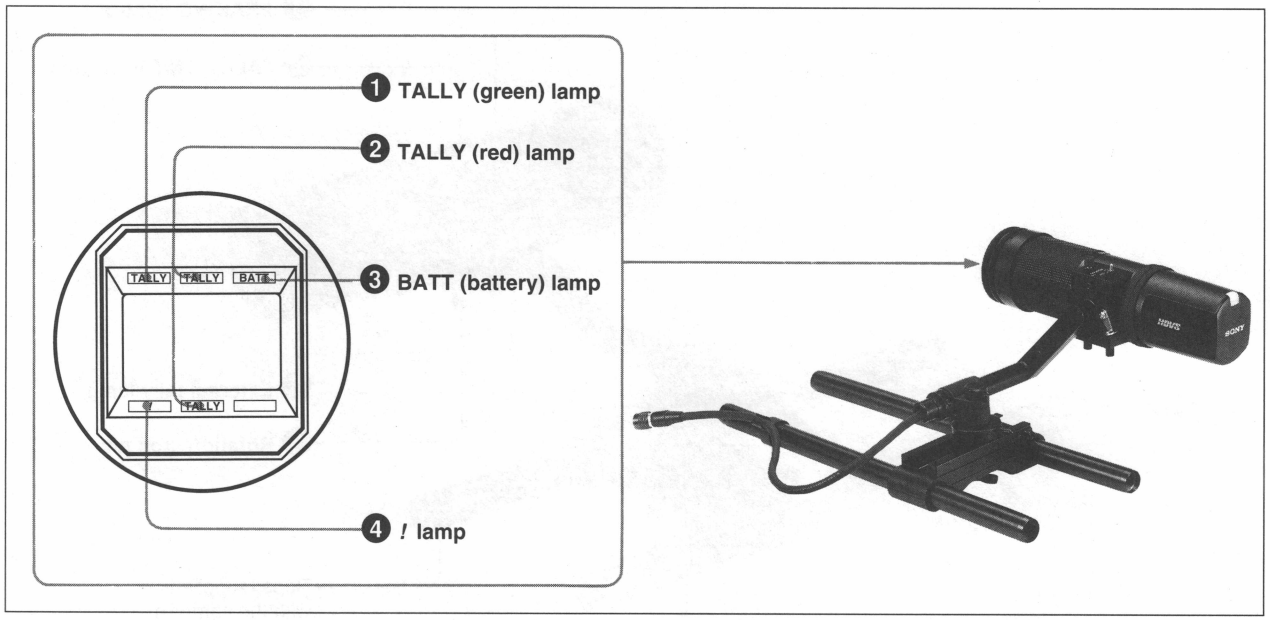
3 External tally lamp
Functions in the same way as the red tally lamp in the viewfinder. This does not light when the TALLY ON/OFF switch 2 is set to OFF.

4 Rotation stop pin
Prevents the unit from rotating by more than about 400°, relative to the arm.

5 Connecting cable and connector
Connect to the VF connector of the camera.

The PEAKING, BRIGHT and CONTR controls do not have effect on the video signals output from the camera.

Viewfinder indicators



1 TALLY (green) lamp
Lights when the camera receives green tally signals.

2 TALLY (red) lamp
Lights when the camera receives red tally signals.

3 BATT (battery) lamp
Blinks several minutes prior to the charge level of the battery of the camera or VTR falling to a level that will prevent the camera operating of the camera.
The lamp lights steadily once the charge has fallen to a level where the camera can no longer operate.

4 ! (operator attention) lamp
Lights in the following cases.

- Video signal gain level is too high
- Lens extender is used
- The electronic shutter is activated
- Super EVS is activated
- Frame reading on

1-3 Attaching the Unit to the Video Camera

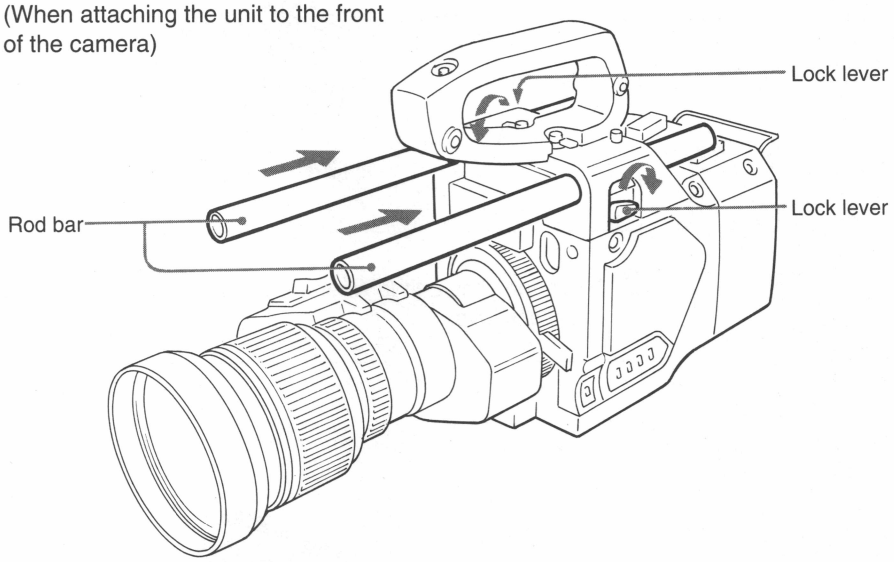
You can attach the viewfinder to the front of the camera or the rear of the camera by using the rods supplied with the camera. Attach the unit to either side of the camera as necessary.

1-3-1 Attaching

Attach the unit to the camera as follows. Decide the attachment position according to how you will be using the camera, while referring to "1-3-2 Attachment Examples".

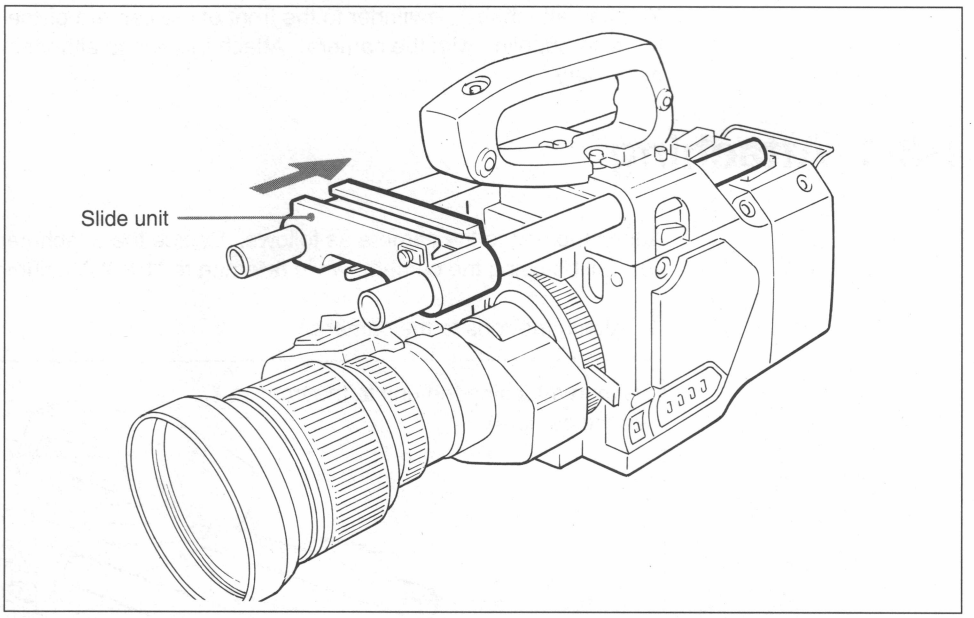
1 Attach the rods to the camera.

(When attaching the unit to the front of the camera)

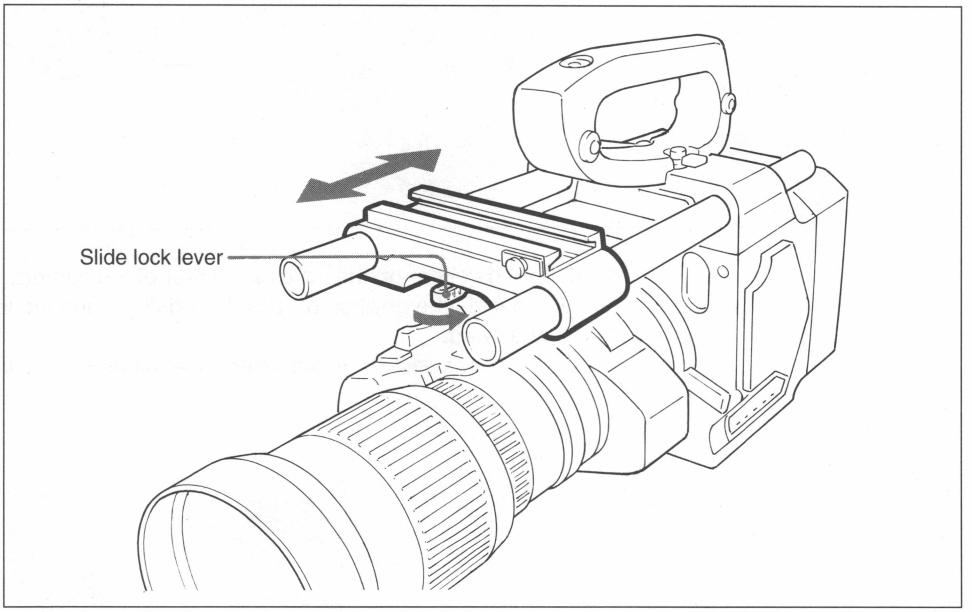


Place the rods either on the front or the rear of the camera.
After you decide the position of rods, fix rods by using the lock levers on both sides of the camera heads.
For details of how to attach the rods, refer to the operation manual of the system.

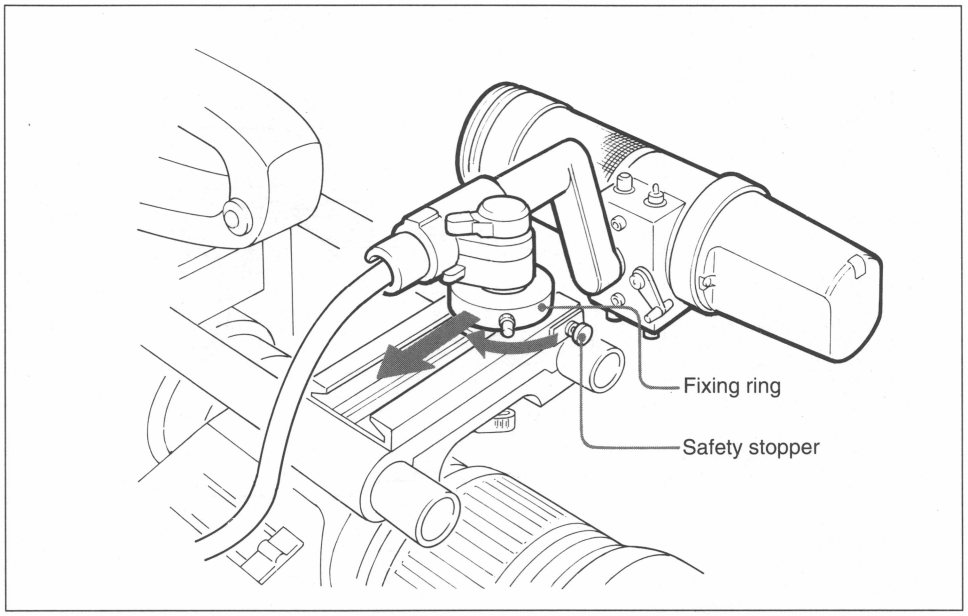
2 Attach the slide unit (supplied with the unit) to the rods.



3 Move the slide unit to where you want to attach the unit and lock the slide unit with the slide lock lever.

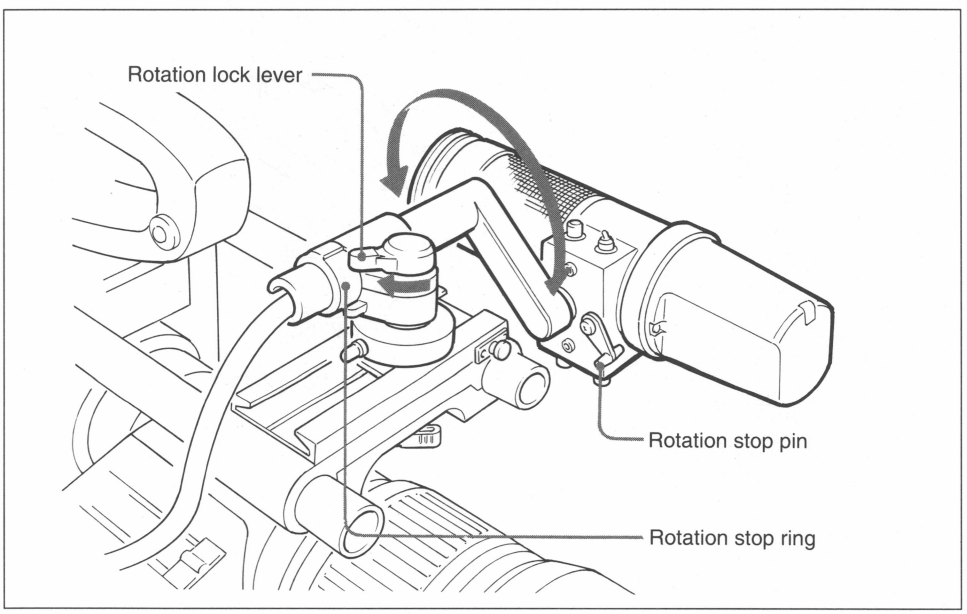


4 Slide the VF mount shoe of the unit onto the slide unit. After positioning the VF mount shoe, lock the VF mount shoe into place by turning the fixing ring.
The safety stopper prevents the VF mounting shoe from coming out from the slide unit.

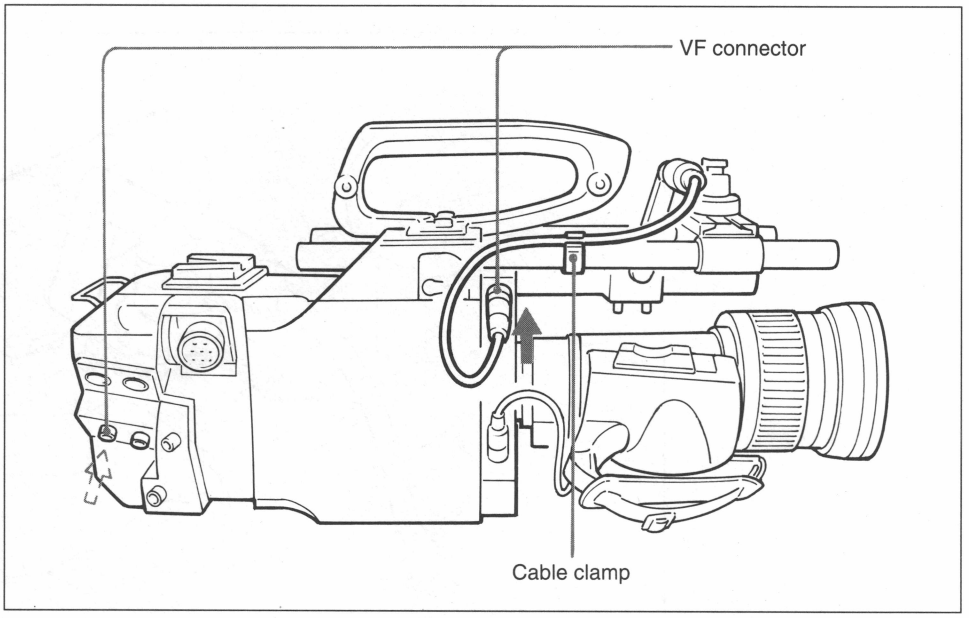


5 Position the viewfinder so that it can be seen clearly, then fix the unit with the rotation lock lever.
You can adjust the locking force with the rotation lock lever when adjusting the angle adjusting arm.

Note
The unit can be turned through about 400°. Further movement is limited by the rotation stop pin. Do not turn it forcibly.

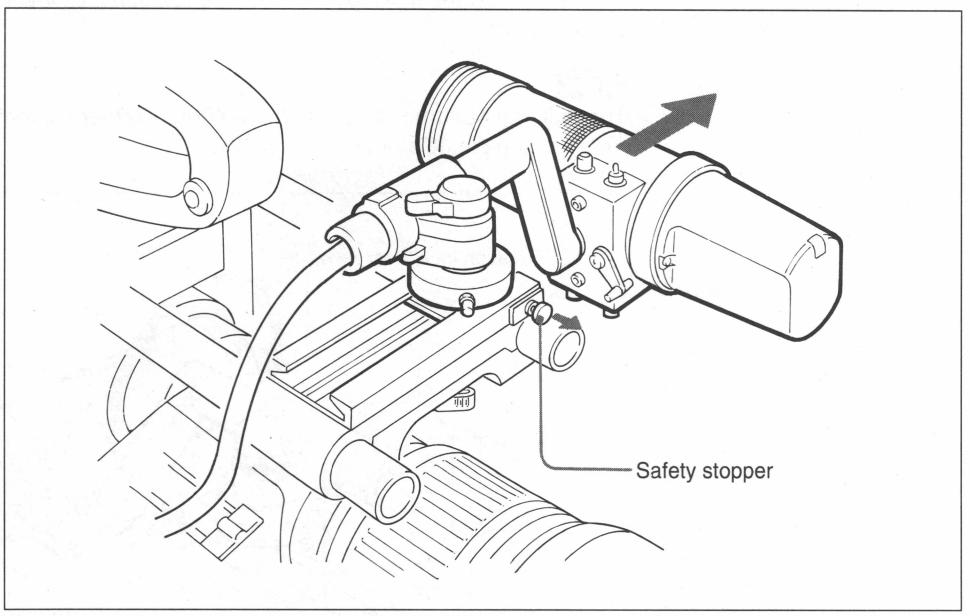


6 Connect the connecting cable to either of the camera's two VF connectors. Fix the connecting cable to the rod using the cable clamp.



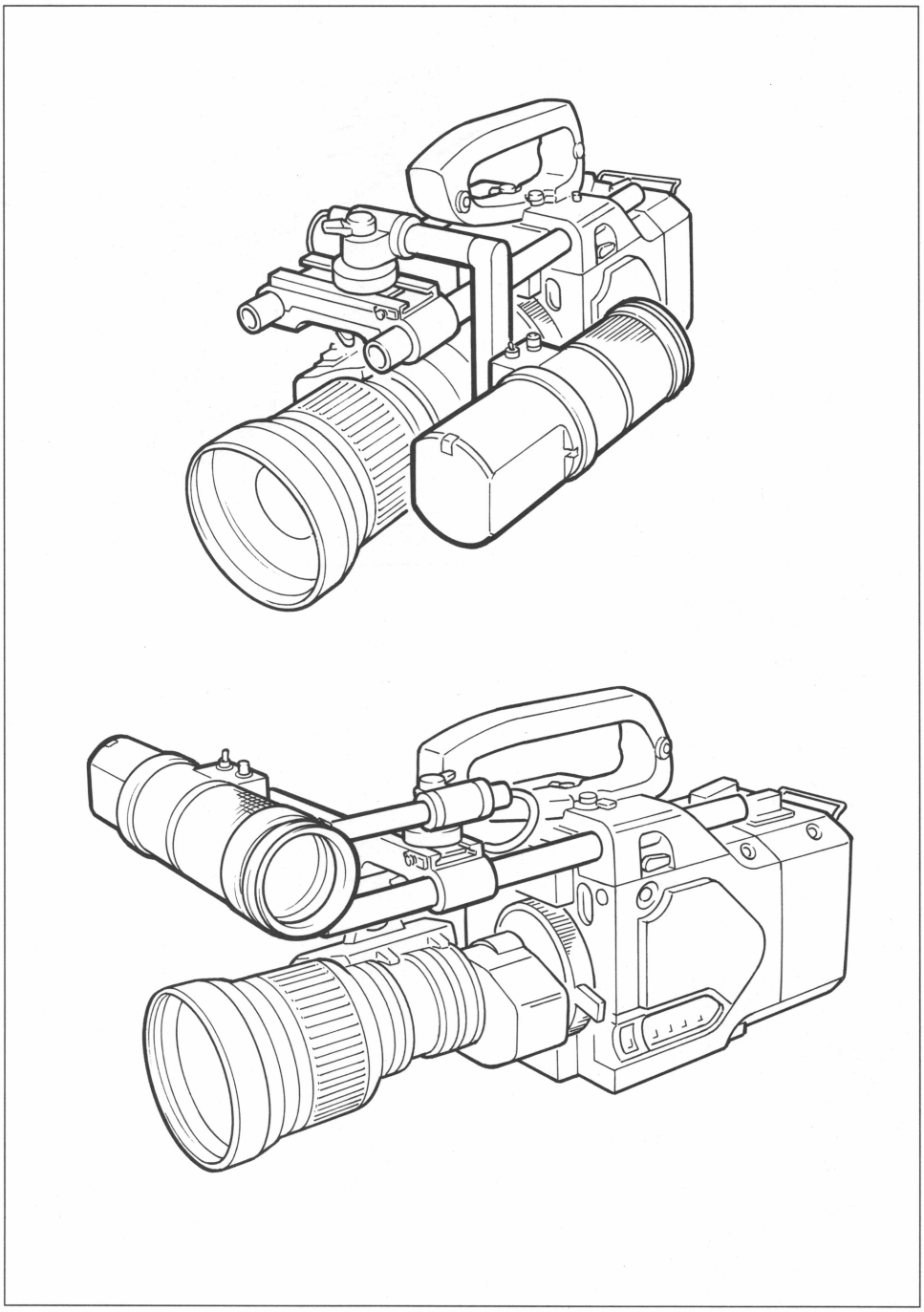
To remove the viewfinder from the slide unit

Loosen the lock lever, then remove the VF mount shoe while pulling the safety stopper out.

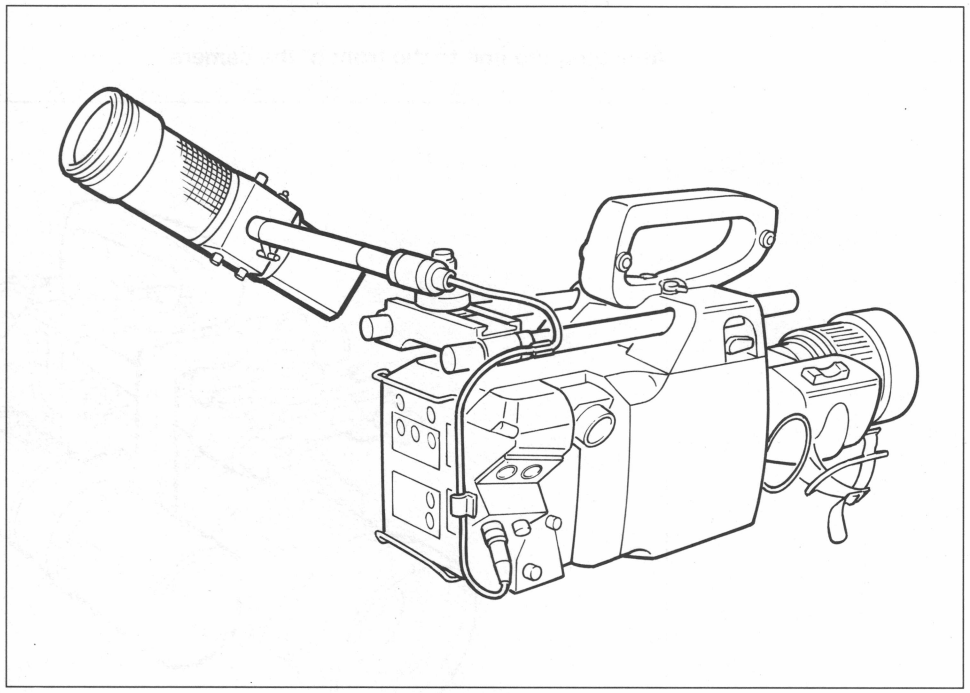


1-3-2 Attachment Examples

Attaching the unit to the front of the camera



Attaching the unit to the rear of the camera



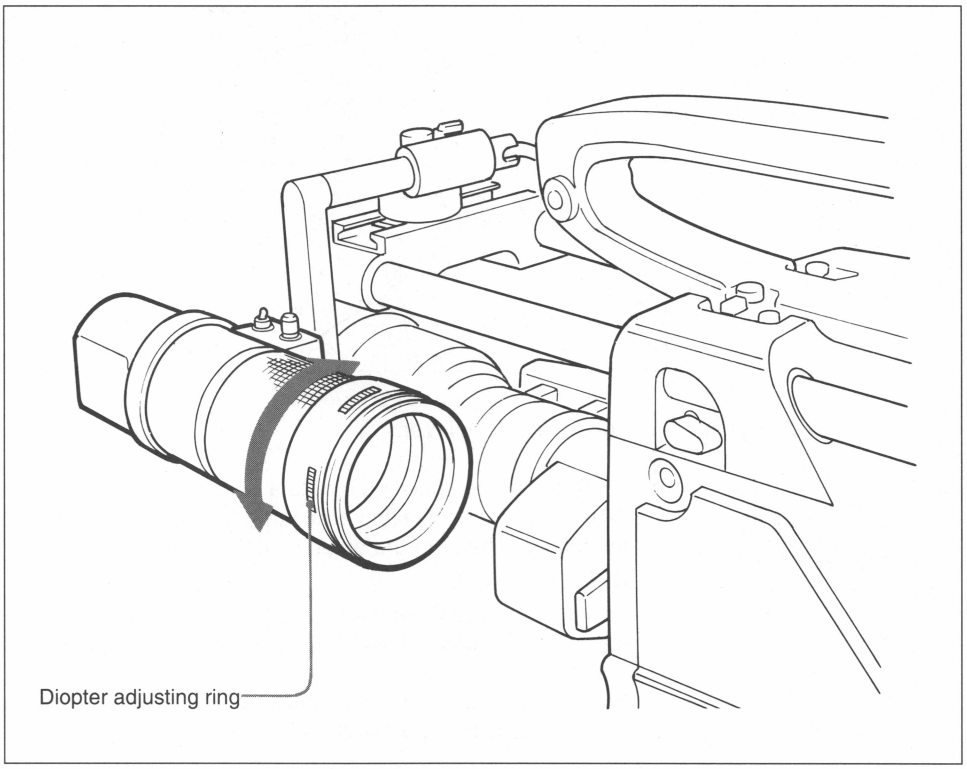
1-4 Operation

When the video camera is turned on, power is also supplied to the unit. A picture will be seen on the screen.
Perform the following adjustments before recording.

- Adjusting the diopter
- Adjusting the angle
- Adjusting the viewfinder screen

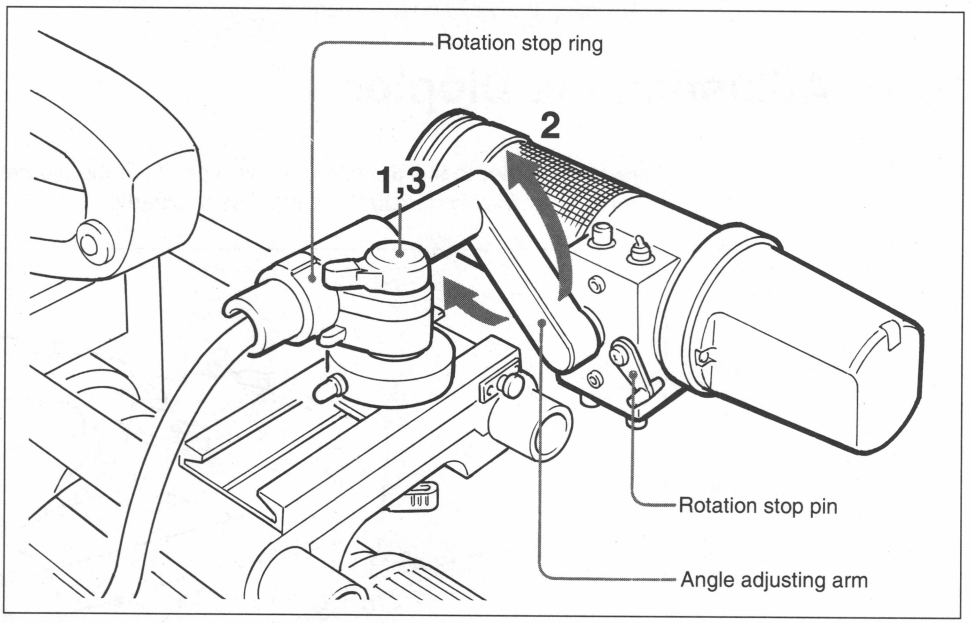
1-4-1 Adjusting the Diopter

Adjust the diopter to suit the camera operator. Turn the diopter adjusting ring so that the picture on the viewfinder screen can be seen clearly.



1-4-2 Adjusting the Angle

Adjust the angle of the viewfinder so that the screen can be easily seen.



1 Loosen the lock lever.

2 Move the angle adjusting arm to a position where the screen can be easily seen. When the angle adjusting arm can not be moved easily, loosen the lock lever to adjust the frictional force of the angle adjusting arm.

Rotational angle

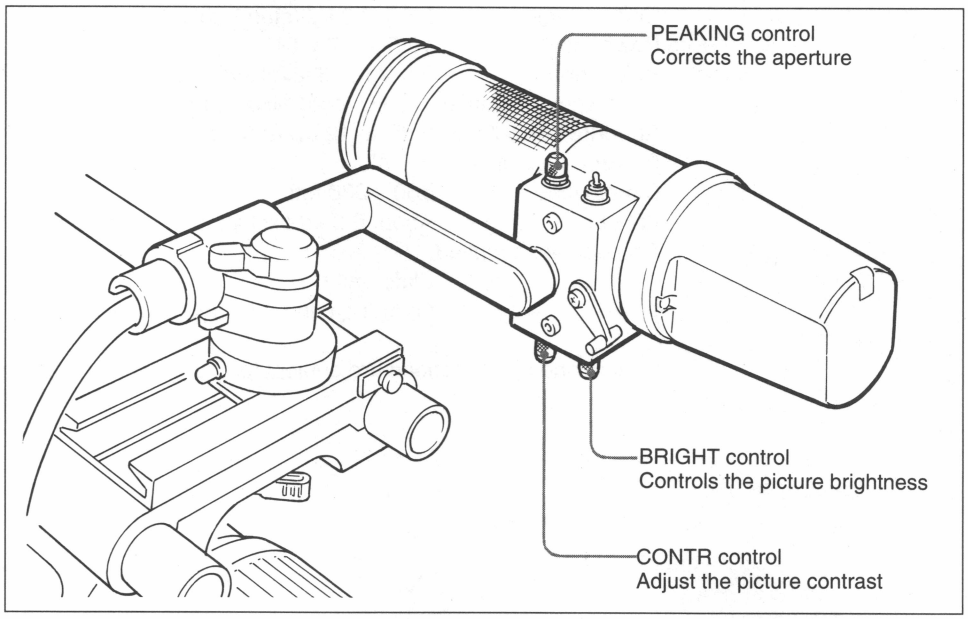
You can turn the viewfinder against through about 400° relative to the angle adjusting arm. The rotation of the unit is stopped with the rotation stop pin. Be careful not to turn it forcibly.

You can also turn the angle adjusting arm about 400°. The rotation is stopped with the rotation stop ring. Be careful not to turn it forcibly.

3 Tighten the lock lever to fix the angle adjusting arm.

1-4-3 Adjusting the Viewfinder Screen

To obtain a good picture, adjust the picture brightness, contrast and aperture correction with the BRIGHT, CONTR and PEAKING controls.



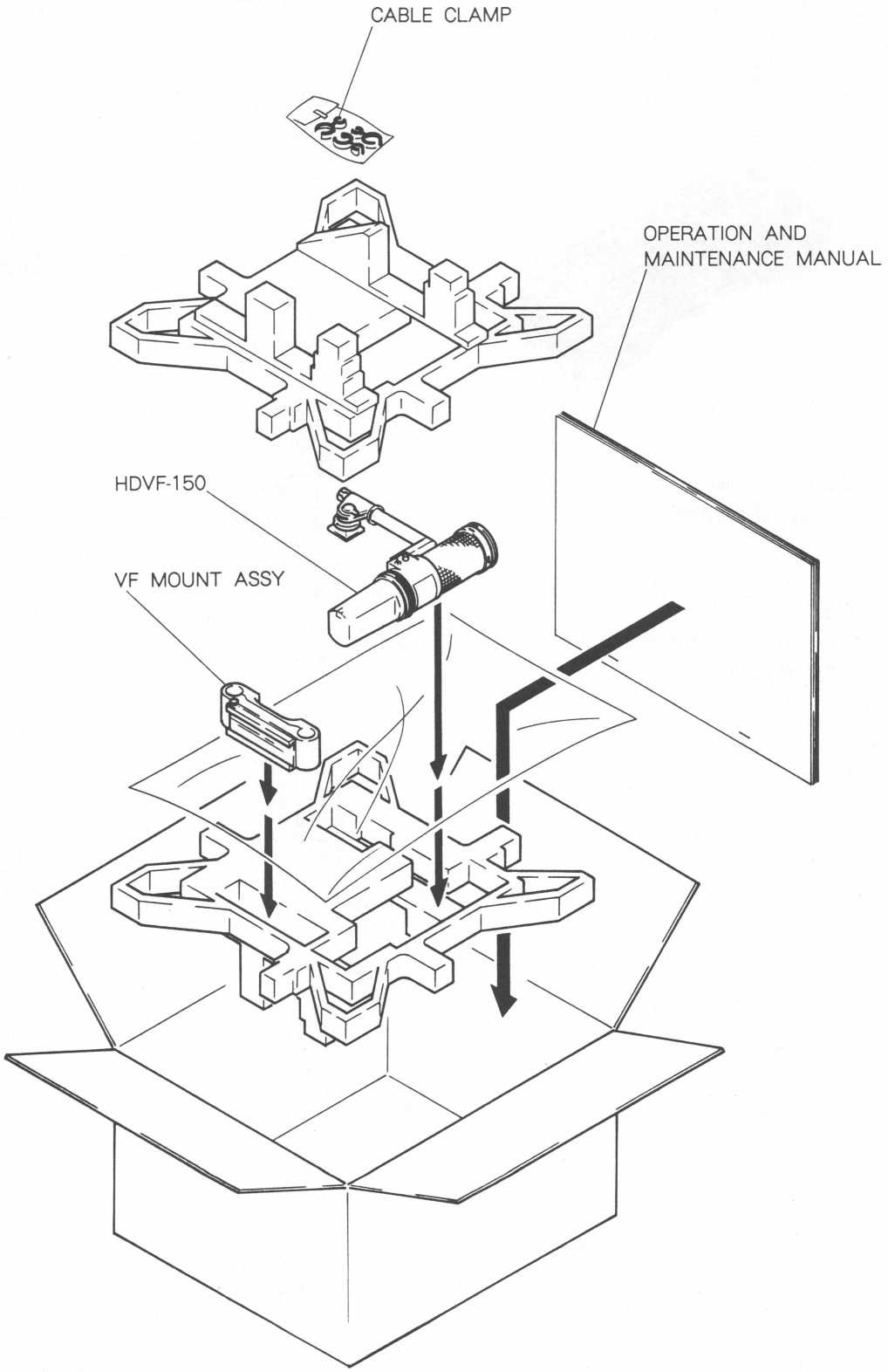
1-5 Specifications

CRT	1.5-inch monochrome 36-degree deflection
Picture size	28 x 15.8 mm (16 : 9) (1 1/8 x 5/8 inches)
Brightness	350 foot-lamberts max.
Resolution	Horizontal: 450 lines
EHT voltage	6.5 ± 0.3 kV (standard)
Power source	10.5 to 17 V DC
Video input	2.0 Vp-p, 3 level sync
Frequency response	100 Hz to 20 MHz ±3dB
Aperture correction	0 dB to 12 dB (8 MHz)
Power consumption	5.5 W
Dimensions	ø60 x 230 mm
Weight	About 0.8 kg excluding the slide unit
Accessories supplied	
	Slide unit (1)
	Operation and maintenance manual (1 set)

Design and specifications are subject to change without notice.

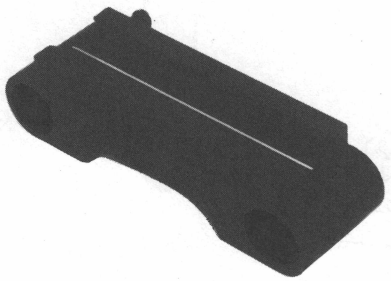
第2章
設　置

2-1. 開梱と再梱包



2-2. 標準付属品

VF マウント ASSY：1 個
本機をHD カラーカメラへ取り付ける際に使用します。取り付け方は，1-3.ビデオカメラへの取り付けを参照して下さい。



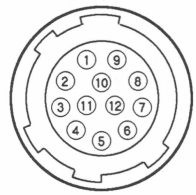
O／M マニュアル：1 冊
HDVF-150 の取り扱い説明書およびサービスマニュアルです。

ケーブルクランプ：3 個
VF ケーブルをHD カラーカメラのアクセサリーロッドにクランプする際に使用します。

2-3. 適合コネクタ／ケーブル

2-3-1. コネクタの入出力信号

VF (12, MALE)



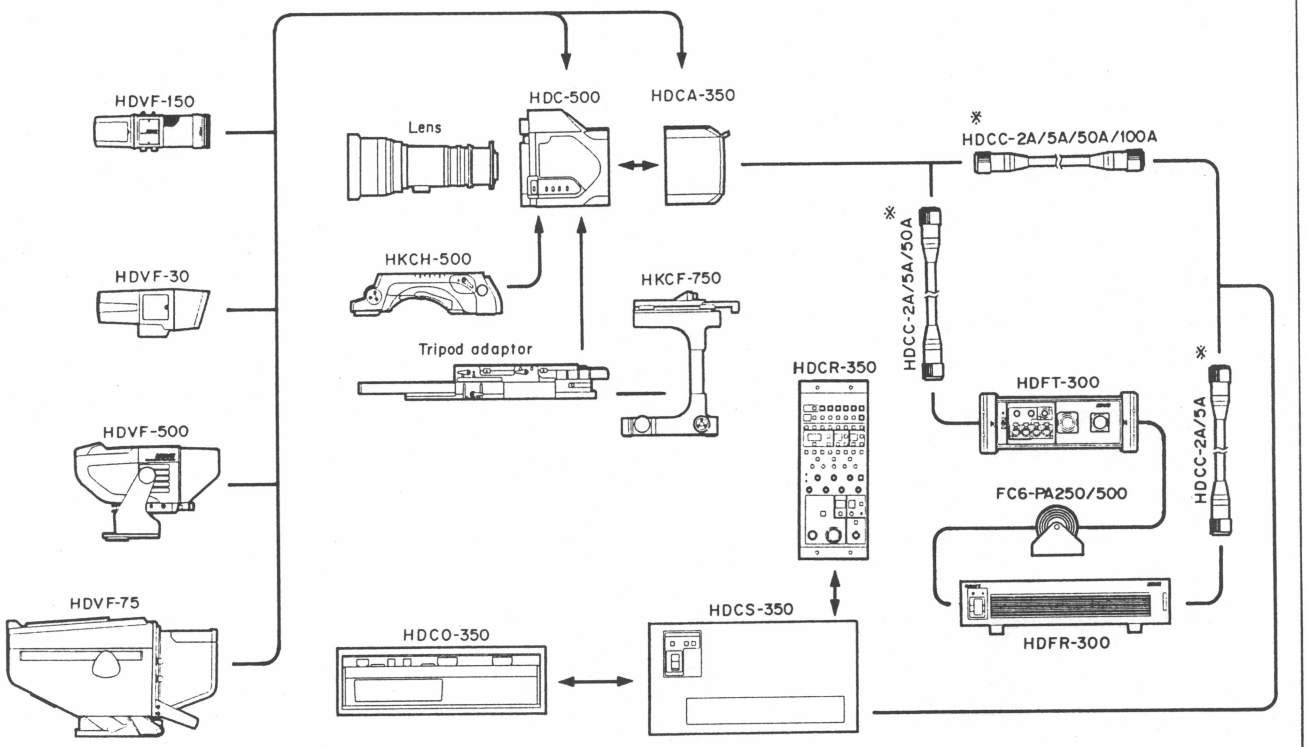
(EXT VIEW)

Pin No.	SIGNAL	REMARK for SIGNAL
1	BATT	DC + 5V : ON
2	UNREG (+ 12V) IN	DC 10.5V～17V, 2A
3	VF VIDEO IN (G)	VBS 1Vp-p, 75Ω
4	VF VIDEO IN (X)	
5	PEAKING ON／$\overline{\text{OFF}}$ IN	ON : + 5V OFF : 0V
6	(Spare)	
7	TALLY − 1 IN	DC + 5V : ON
8	EFFECT	DC + 5V : ON
9	(Spare)	
10	UNREG (GND) IN	GND for UNREG (+ 12V)
11	VTR SAVE	DC + 5V : ON
12	TALLY − 2 IN	DC + 5V : ON

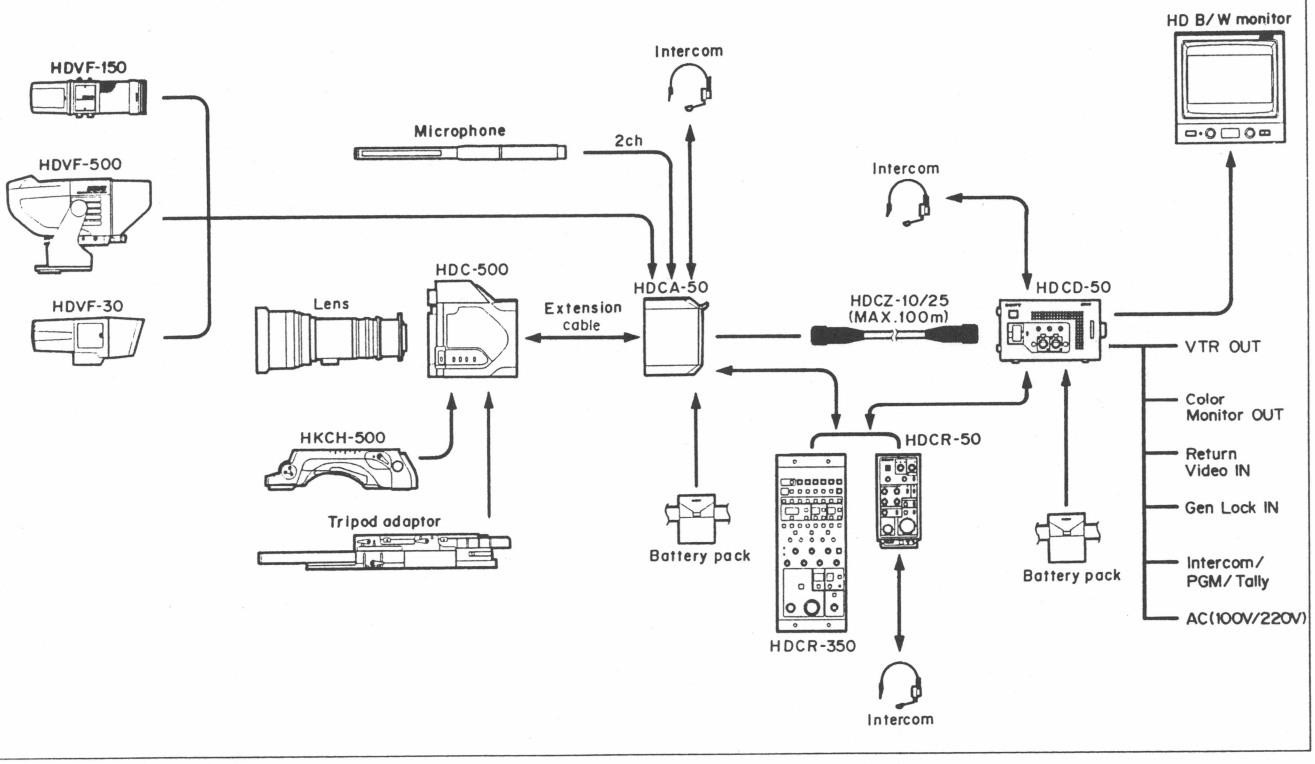
2-4. システム接続例

HDC-500 CCU SYSTEM

※ これらのケーブルは、HDCC-2／5／50／100 と互換性があります。

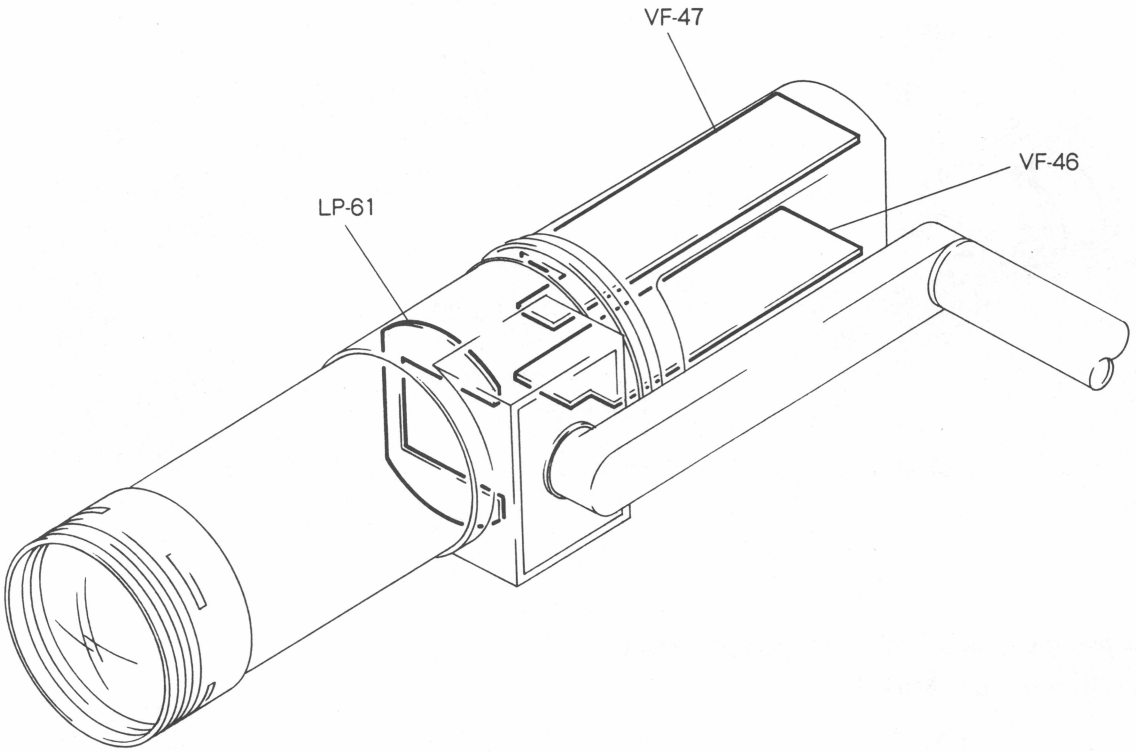


HDC-500 STAND-ALONE SYSTEM



第3章
点検および保守

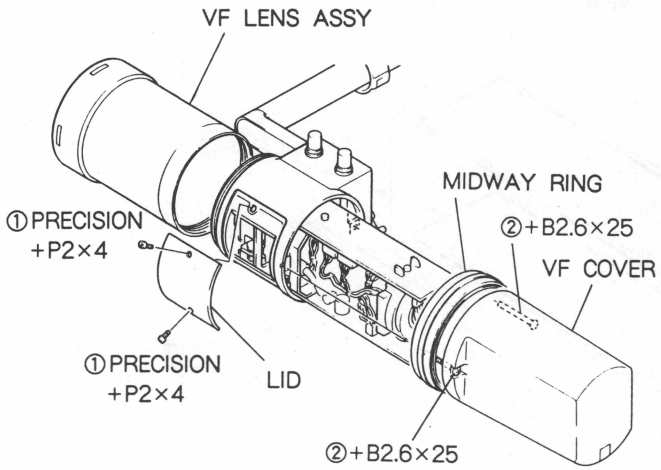
3-1. 基板配置図



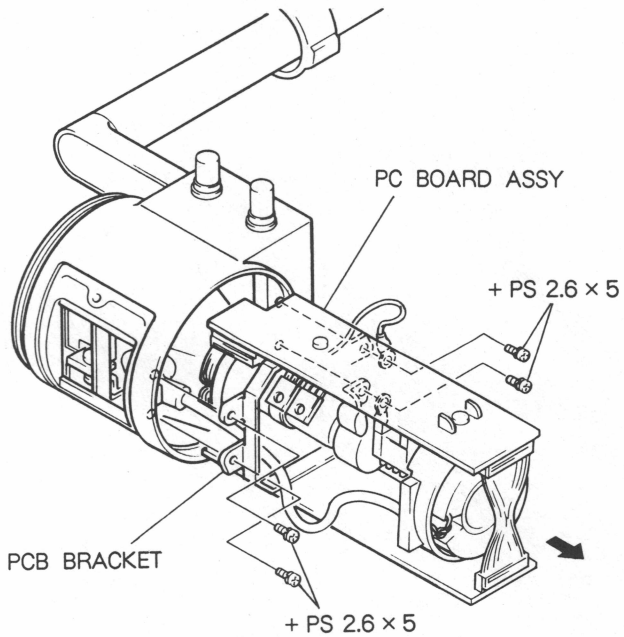
3-2. CRTおよびDEFLECTION YOKEの交換方法

外し方

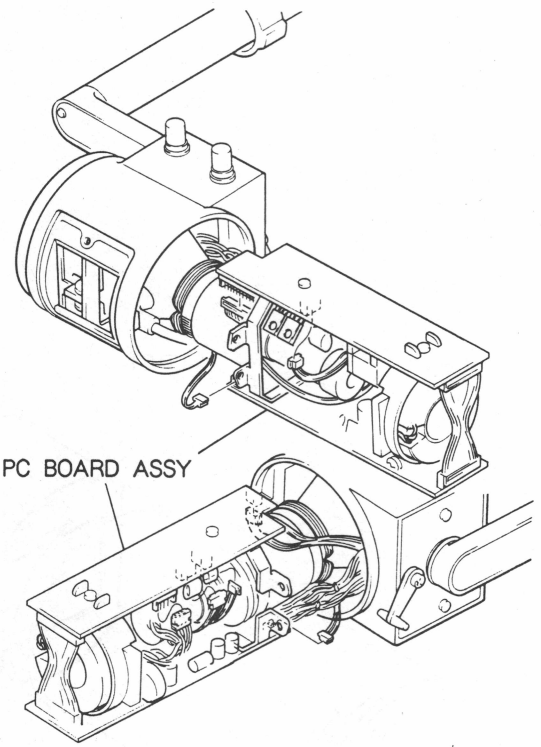
1. ねじ① (PRECISION +P2×4) 2本を外し, LIDを外します。
2. ねじ② (+B2.6×25) 2本を緩め, MIDWAY RINGとVF COVERを外します。



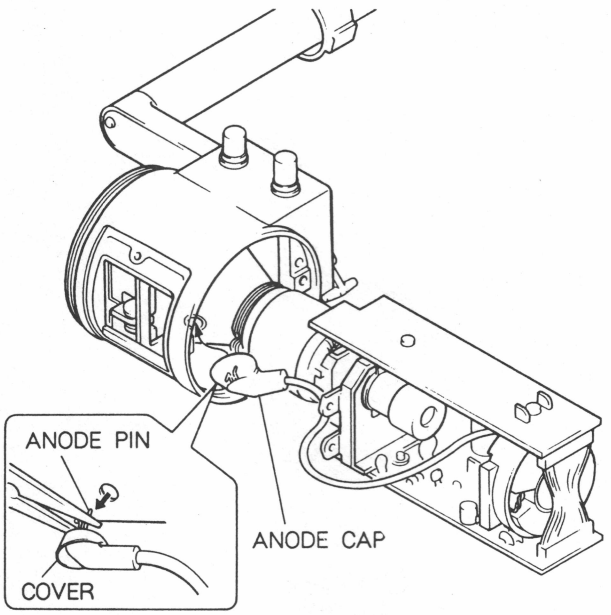
3. ねじ (+PS2.6×5) 4本を外し, PC BOARD ASSYを矢印方向にゆっくり引き出します。



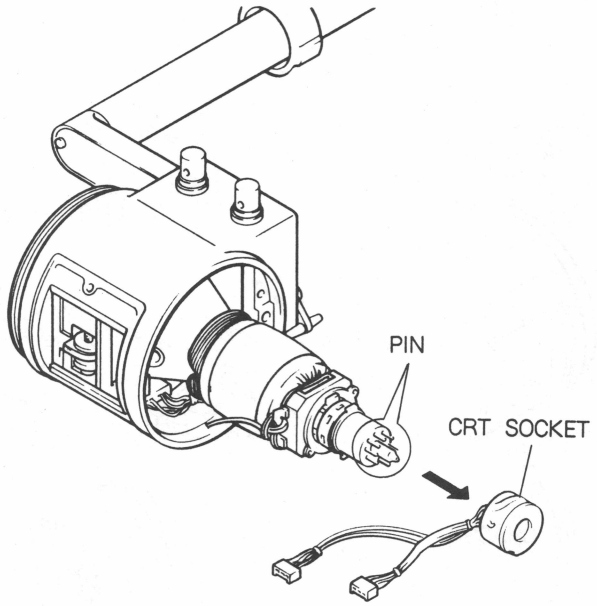
4. PC BOARD ASSYの左右8個のコネクタを引き抜きます。



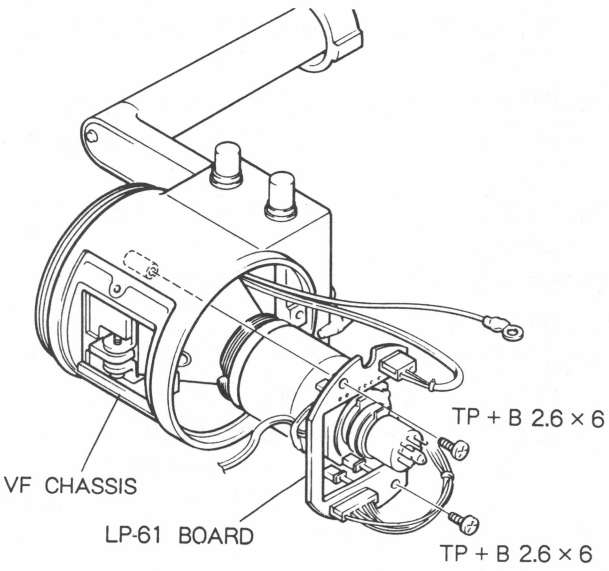
5. ANODE CAPのCOVERを図のようにめくり, ANODE PINをピンセット等ではさみ, ANODE CAPを外します。



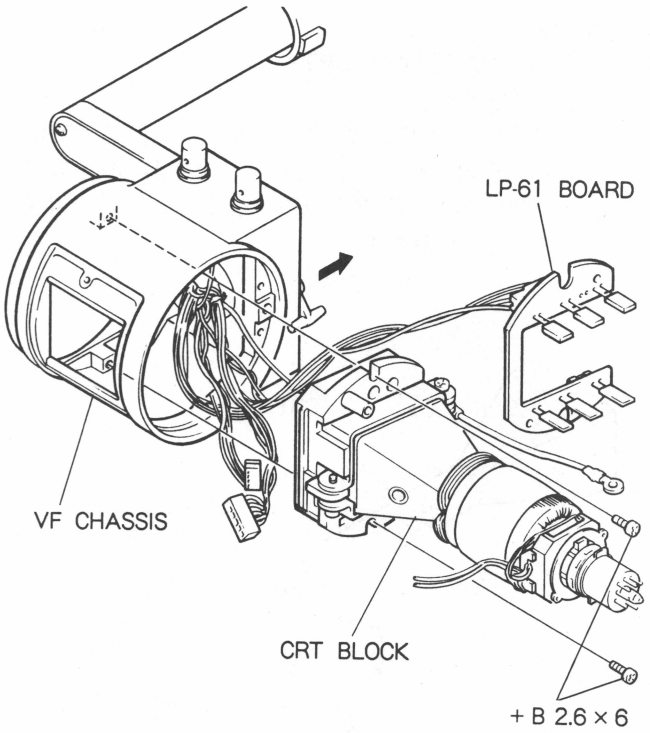
6. CRTのPINを曲げないように注意し，CRT SOCKETを外します。



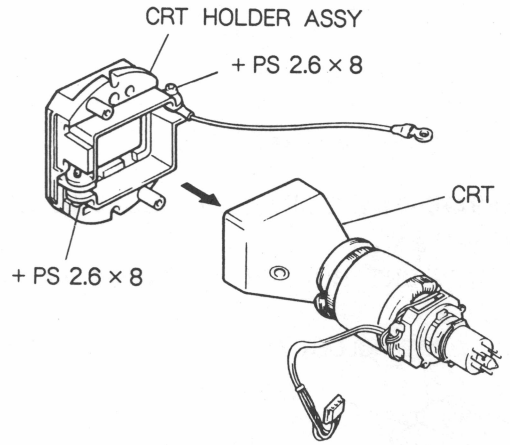
7. ねじ（TP+B2.6×6）2本を外し，LP-61BOARDをVF CHASSIS（CRT HOLDER ASSY）より外します。



8. ねじ（+B2.6×6）2本を外し，CRT BLOCKをVF CHASSISより外します。



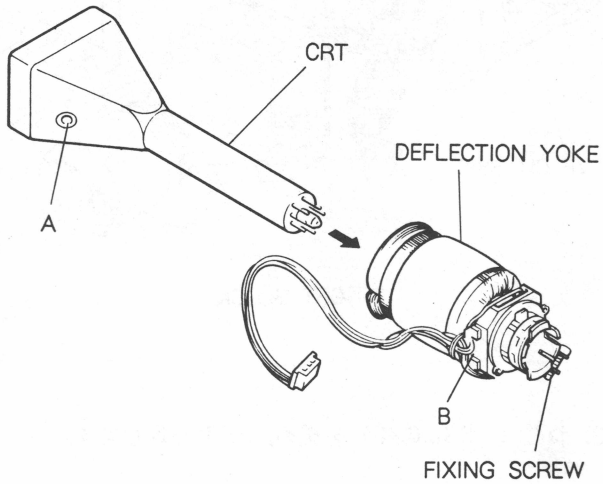
9. ねじ（+PS2.6×8）を緩め，CRTを外します。



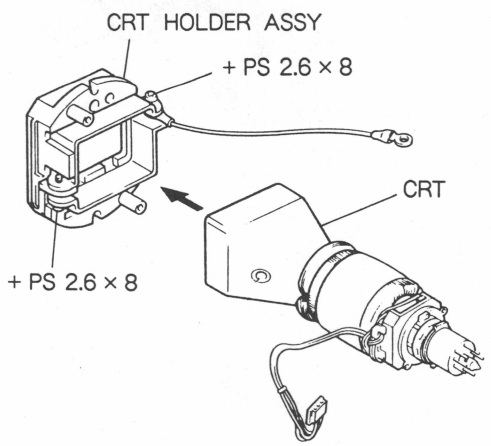
10. FIXING SCREWを緩め，CRTよりDEFLECTION YOKEを外します。

取り付け方

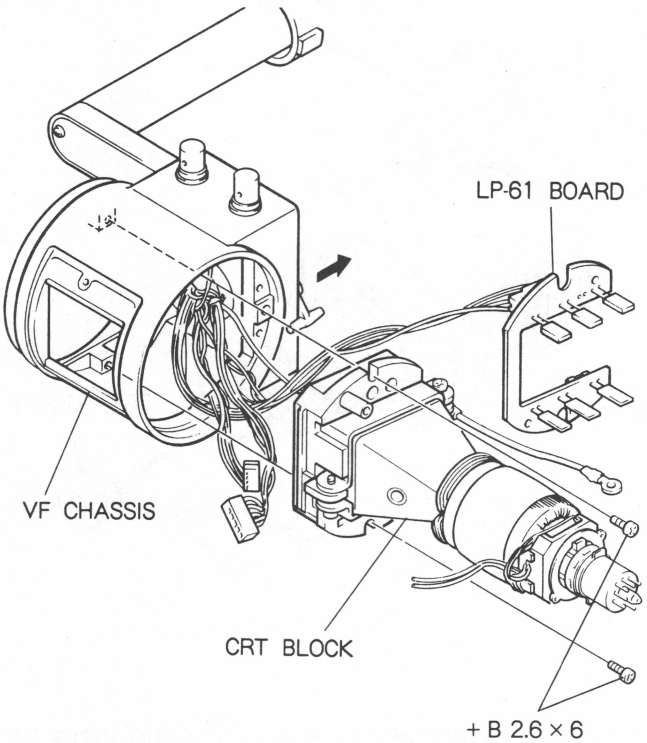
11. STEP10の逆の要領で，CRTへDEFLECTION YOKEを取り付けます。
    注：CRTのANODE PIN側（A面）とDEFLECTION YOKEのハーネス側｛(赤，黄2本）B面｝を同じ側面にし，DEFLECTION YOKEをCRTの根元まで差し込みます。



12. STEP9の逆の要領でCRTをCRT HOLDER ASSYに取り付けます。
    注：CRTとCRT HOLDER ASSYの向きを図のようにします。



13. STEP8の逆の要領でCRT BLOCKをVF CHASSISに取り付けます。
    注：VF CHASSISから出ているハーネスを矢印方向に寄せながら作業を行います。



14. STEP7の逆の要領でLP-61 BOARDをVF CHASSISの中のCRT HOLDER ASSYに取り付けます。
    注：発光ダイオード6個をCRT HOLDER ASSYの切り込みに入れます。
15. STEP6の逆の要領でCRT SOCKETを差し込みます。
    注：CRT SOCKETにPINがあるので，向きに注意する。
16. STEP5の逆の要領でANODE CAPをCRTのANODE端子に差し込みます。
17. STEP4の逆の要領でコネクタ8個を各基板の各コネクタに差し込みます。
18. STEP3の逆の要領でPC BOARD ASSYをVF CHASSISに取り付けます。
    注：PC BOARD ASSYをVF CHASSISの中に入れると時，ゆっくりとハーネスを引き出しながら入れます。VF CHASSIS内部でハーネスがたるんでいるとCRT BLOCKが取り付かない場合があります。
19. STEP18で引きだしたハーネスをPC BOARD ASSYの中に入れてSTEP1の逆の要領でVF COVER／LID／VF LENSを取り付けます。

3-3. 点検および保守上の注意事項

3-3-1. 補修用部品注意事項

(1) 安全重要部品
回路図，分解図，電気部品表中，⚠印および▒で囲まれた部品は，安全性を維持するために重要な部品である。従ってこれらの部品を交換するときは必らず指定の部品と交換すること。

(2) 部品の共通化
ソニーから供給される部品は，セットに実装されているものと異なることがある。これは部品の共通化，改良等によるものである。分解図や電気部品表中には現時点での共通化された部品が記載されている。

(3) 部品の在庫
リスト中，SP欄で“S”で示されている部品は常時在庫します。SP欄で“O”で示されている部品は交換頻度が低い部品ですので，一般には在庫しません。そのため，納期が長くなることがあります。

(4) コンデンサ，インダクター，抵抗の単位
回路図，分解図，電気部品表中，得に明記したものを除き，下記に単位は，省略されている。
コンデンサ　：μF
インダクター：μH
抵抗　　：Ω

3-3-2. 点検および保守上の注意事項

(1) CRTおよびそのネック部の調整器の取り扱いの際は十分注意し，CRTに無理な力をかけないようにして下さい。

(2) モニタ動作中の点検は，特に高圧回路および偏向回路の点検は高電圧6.5kV，高圧パルス1kVP-Pが発生している部分がありますので，感電に注意して下さい。また，プリント基板内にも100V，1kVの電源ラインが通っていますので，素手や工具等で触れたりしないよう注意して下さい。

(3) CRT交換または点検のため，CRTに触れる場合は，必らず電源を切ってから高圧アノードキャップを外し，アノード電極の蓄積電荷をテスタリード等により放電させ，危険のないようにしてから作業を行って下さい。

3-4. 治工具

（治工具名称）	（ソニー部品番号）
マルチバーストチャート	J-6026-110-A
レジストレーションチャート	J-6026-120-A
パターンボックス“PTB-500”	J-6026-140-A
調整用ドライバー	7-700-733-01

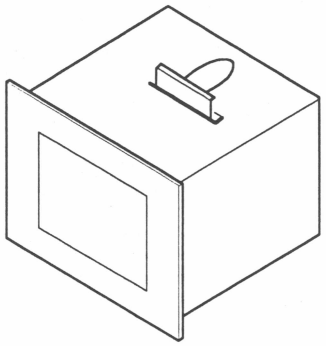
第4章
調整要項

4-1. 使用機器

- HDVSカメラシステム
  (HDC-500, HDCA-350, HDCO-350, HDCS-350)
- オシロスコープ
  テクトロニクス社 2465または相当品
- HDVS波形モニター
  テクトロニクス社 1730HDまたは相当品
- HDVS白黒モニター
  ソニー HDM-145または相当品

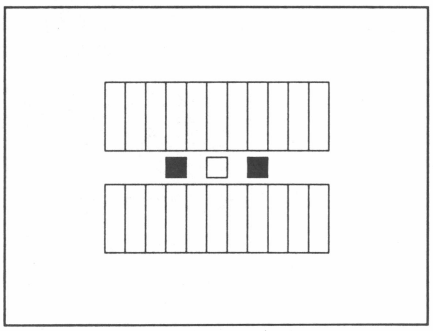
J-6029-140-B	パターンボックスPTB-500

PTB-100も使用できます。

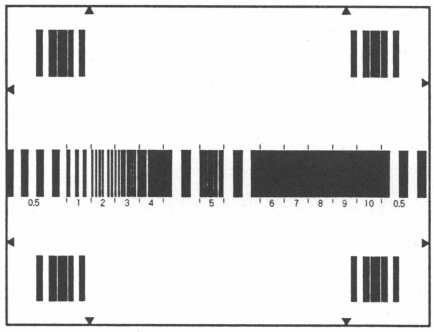


J-6026-130-B	グレイスケールチャート

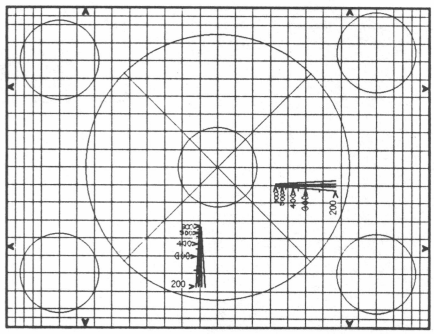
中央の白の両側に黒いベルベットを貼り,
光が漏れないようにします。



J-6026-110-A	バーストチャート



J-6026-120-A	レジストレーションチャート



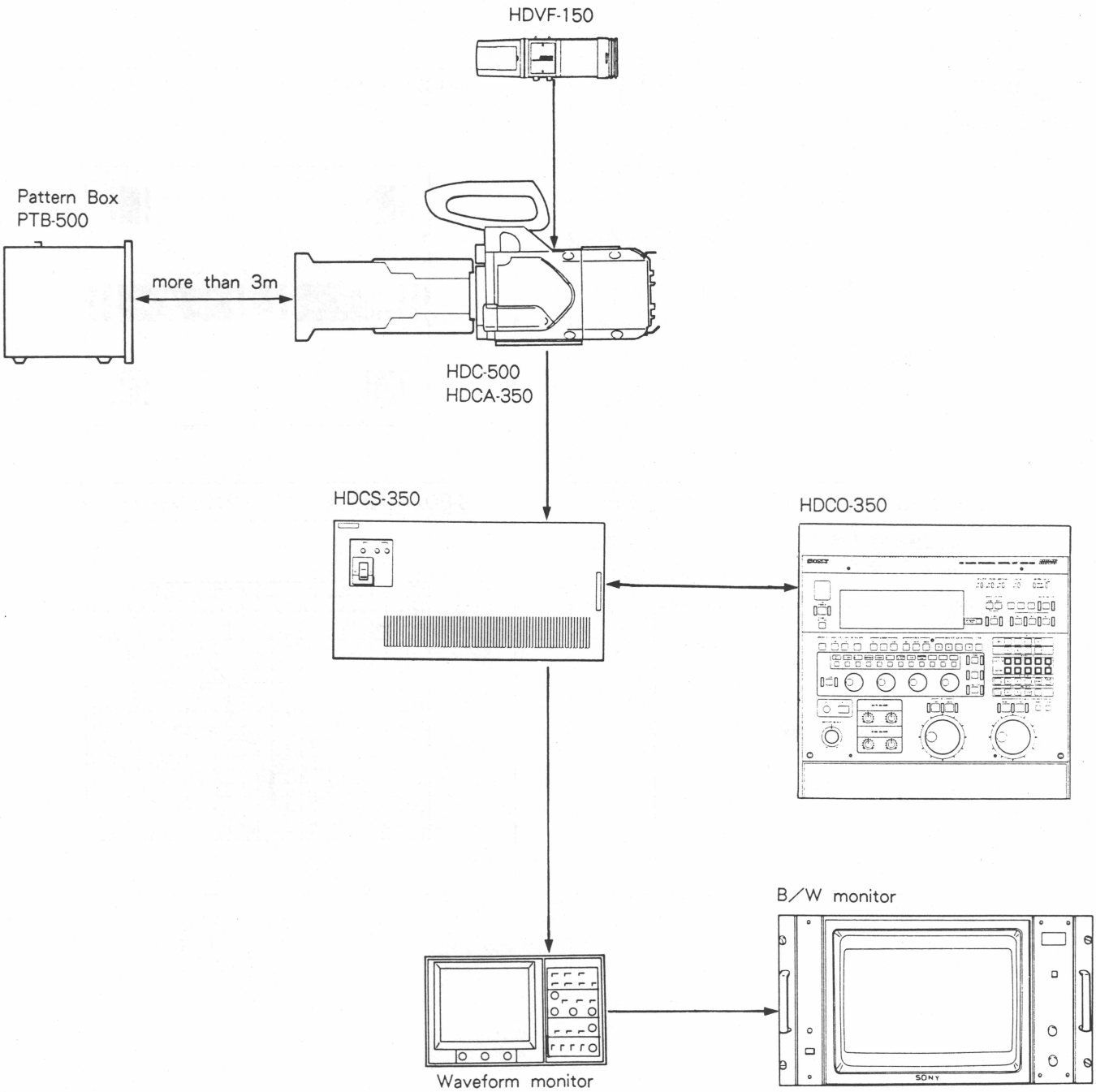
4-2. 調整前の準備

4-2-1. 調整前の注意

- 本機の調整は，完全に調整されているHDVSカメラシステム（HDC-500, HDCA-350, HDCO-350, HDCS-350）を使用して，従来のテストパターンチャートを撮像しながら行います。
- 本機には偏向回路などの高圧回路が搭載されていますので，取り扱いに十分注意してください。

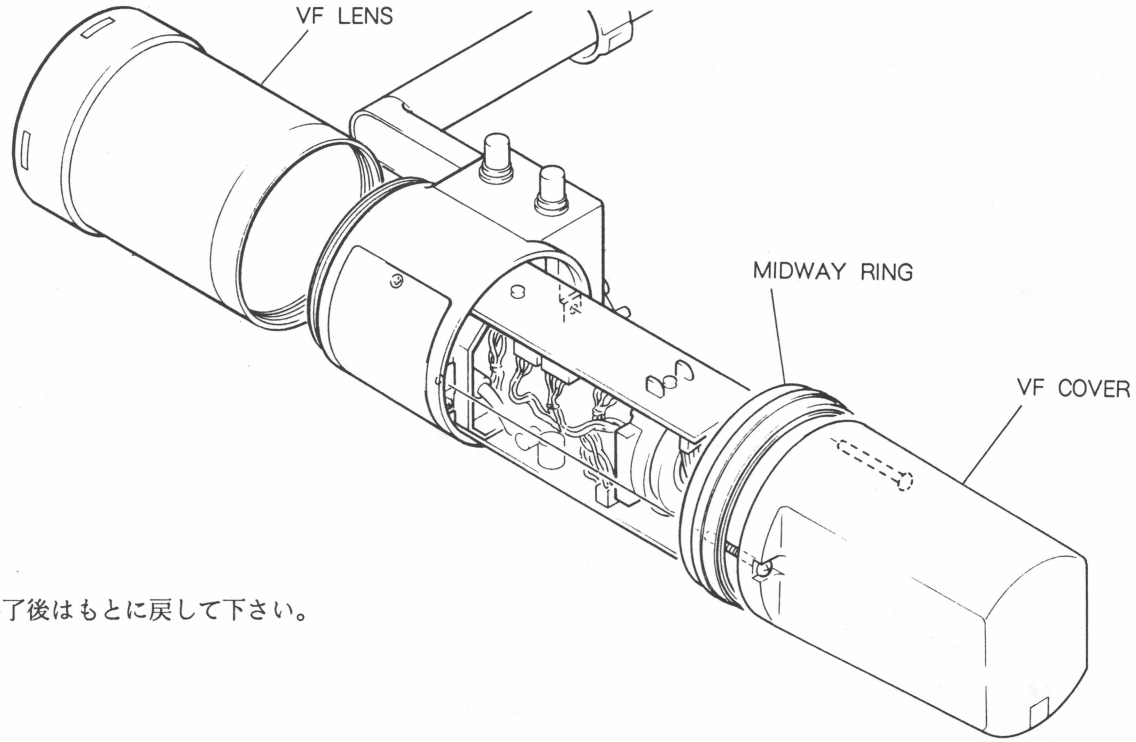
4-2-2. 接続

- HDVSカメラシステムを下図のように接続し，ビューファインダー画面にテストパターンチャートが映るように設定します。



4-2-3. VF COVERの取り外し

1. VF LENSを取り外し，画面を見やすくします。
2. ネジを緩めて，VF COVERを取り外します。



3. 調整終了後はもとに戻して下さい。

4-3. 初期設定

各ボリュームを下記のように設定します。

◔PEAKING VOL →メカニカルセンター
◔BRIGHT VOL →メカニカルセンター
◔CONTRAST VOL →メカニカルセンター
TALLYスイッチ（ビューファインダー側面）→OFF

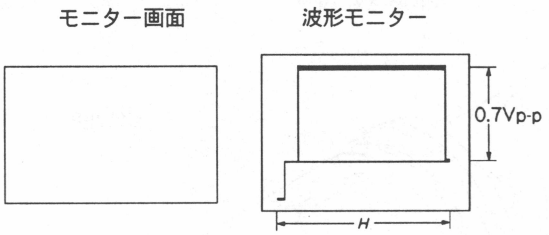
4-4. 調整

4-4-1. 垂直ホールド調整

準備

- 完全に調整されたHDVSカメラシステムでパターンボックスを撮像します。

被写体： 全面白パターン



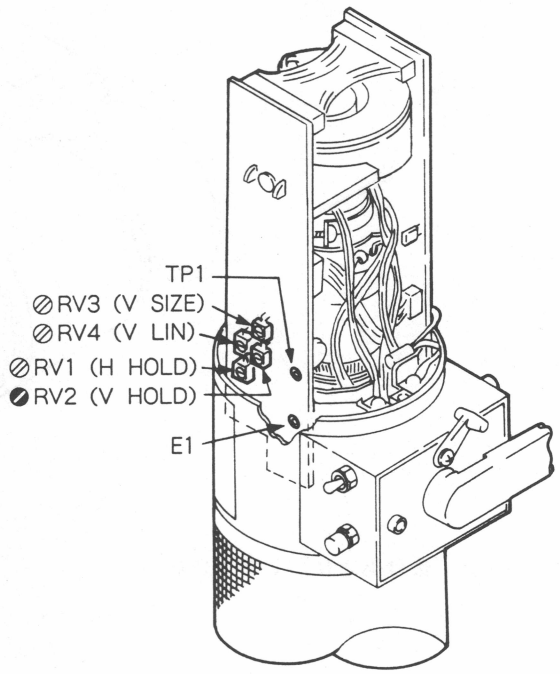
レンズズーム：TELE 端

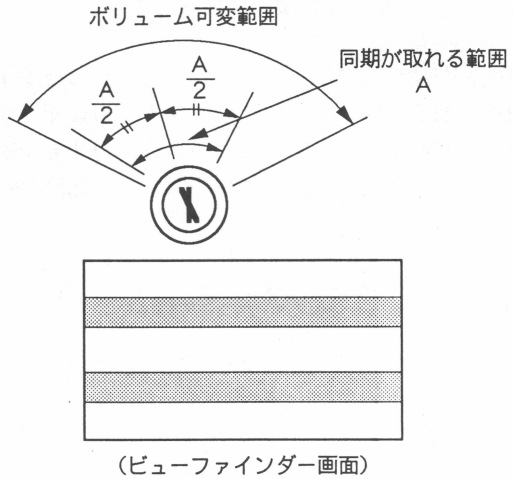
レンズ絞り： 白レベル＝0.7Vp-p

調整箇所： ◐RV2／VF-47基板

調整手順

- ◐RV2を回して，ビューファインダー画面の同期が乱れる点を捜します。次に同期が止まる範囲を捜し，その範囲の中点に◐RV2をセットします。





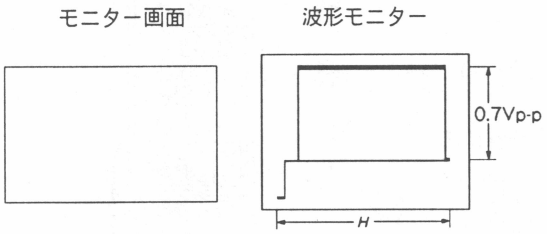
4-4-2. 水平ホールド調整

測定器： オシロスコープ

準備

- 完全に調整されたHDVSカメラシステムでパターンボックスを撮像します。

被写体： 全面白パターン



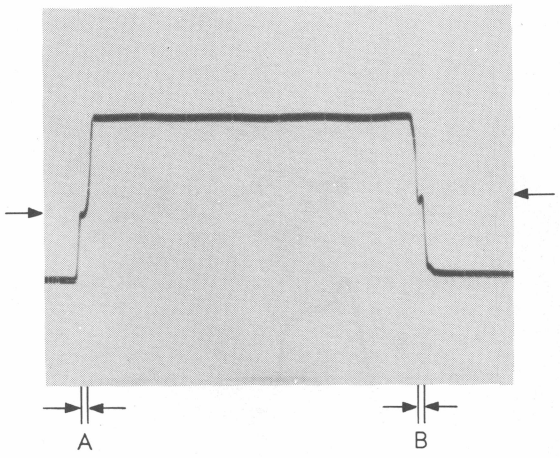
レンズズーム：TELE 端

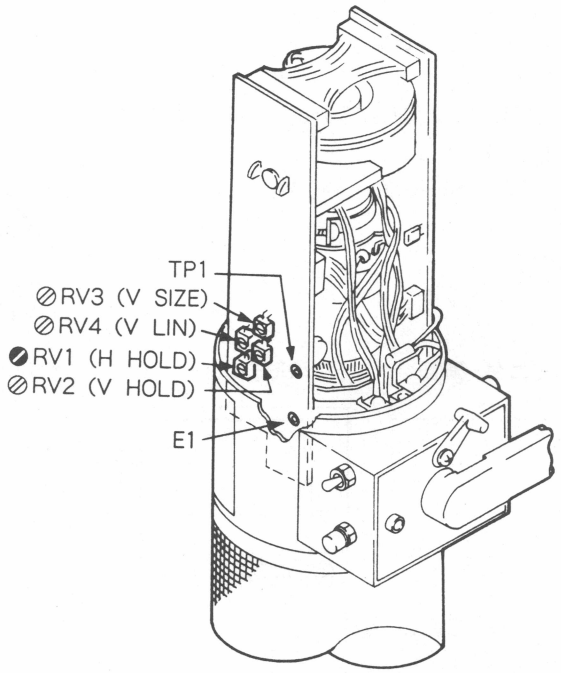
レンズ絞り： 白レベル＝0.7Vp-p

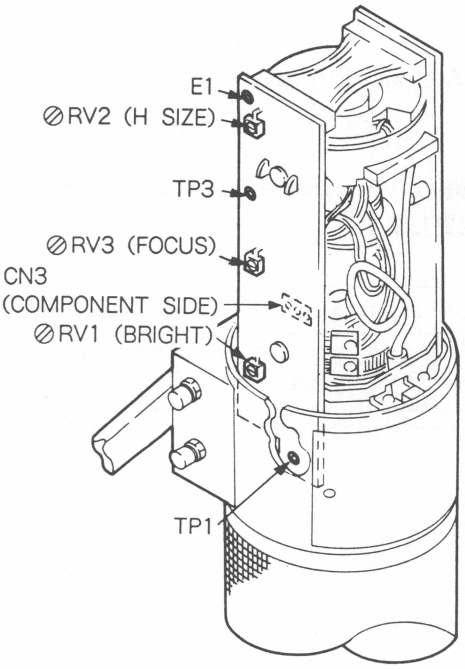
測定点： CN3-2ピン／VF-46基板

調整箇所： ◐RV1／VF-47基板

規格： A＝B







4-4-3. フライバックパルス幅調整

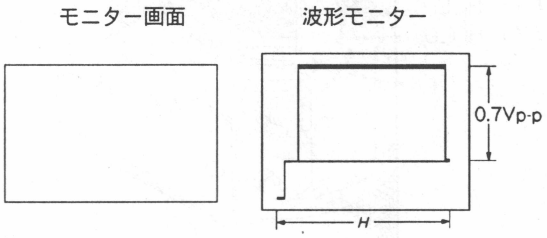
注意事項：本調整は，フライバックトランス（T2／VF-46基板）または偏向ヨークを交換した場合にのみ行ってください。

測定器：　　オシロスコープ

準備

- 完全に調整されたHDVSカメラシステムでパターンボックスを撮像します。
- ◔CONT　VR→◯左一杯

被写体：　　全面白パターン



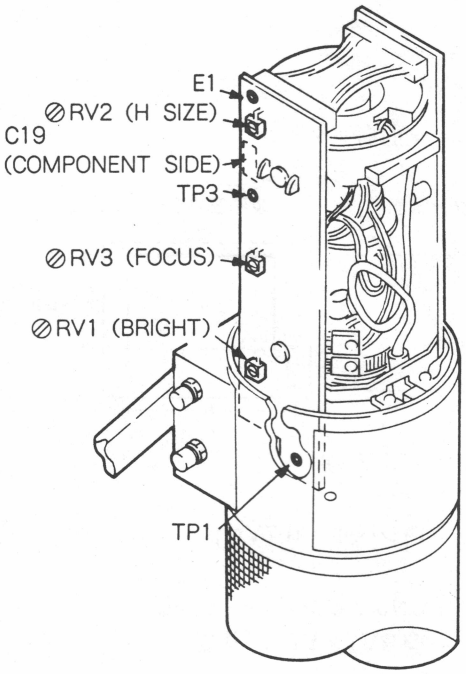
レンズズーム：TELE 端

レンズ絞り：　白レベル＝0.7Vp-p

測定点：　　TP3／VF-46基板

調整箇所：　　コンデンサー（C19）

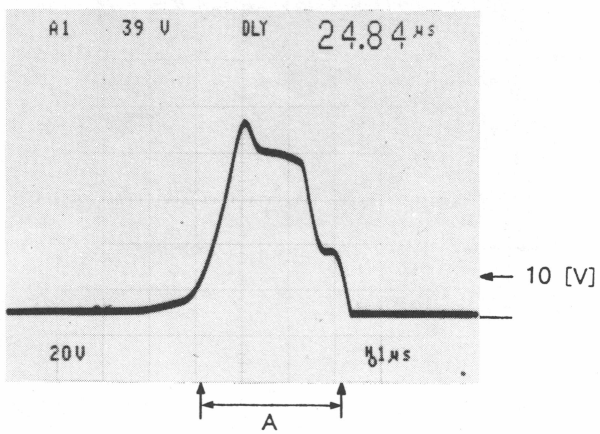
規格：　　A＝3.2 ± 0.1 μsec



調整手順

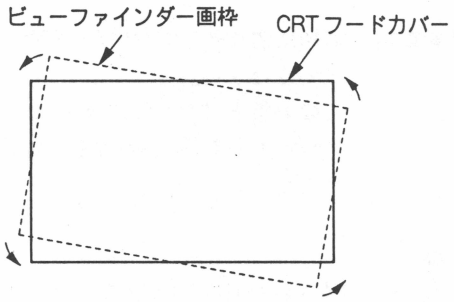
- パルス幅が規格外の場合はVF-46基板のC19の定数を下表に従って変更します。

	CAPACITANCE	PART NUMBER
C19	0.0015μF	1-106-347-00
	0.0022μF	1-106-351-00



注意事項：調整終了後，◔CONT　VRを元の位置に戻します。

4-4-4. 偏向ヨーク傾き調整

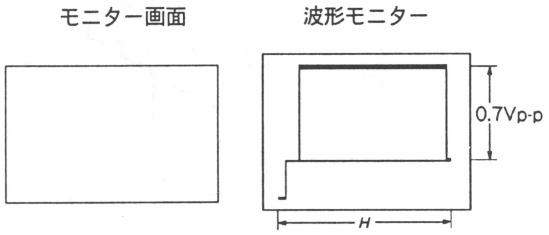


注意事項：CRTフードカバーとビューファインダーの画枠が平行であることを確認します。画枠が傾いている場合は，下記の調整手順を行ってください。

準備

- 完全に調整されたHDVSカメラシステムでパターンボックスを撮像します。

被写体：　全面白パターン



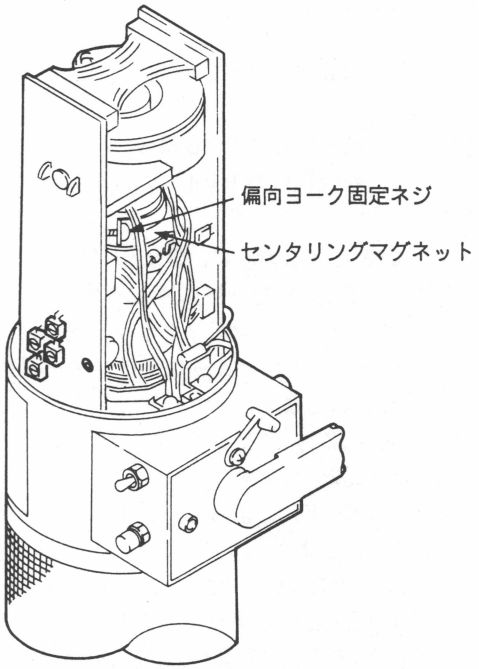
レンズズーム：TELE 端

レンズ絞り：　白レベル＝0.7Vp-p

調整箇所：　偏向ヨーク

調整手順

1. ビューファインダーのコネクタをカメラのVF端子から外します。
2. 偏向ヨークの固定ネジを緩めます。
3. ビューファインダーのコネクタをカメラのVF端子に接続します。
4. ビューファインダー画面の上部を見ながら偏向ヨークを回し，CRTフードカバーとビューファインダーの画枠を平行にします。



注意事項：調整終了後，一旦VF端子からコネクタを外し，偏向ヨーク固定ネジを締めます。
再度ビューファインダーのコネクタをカメラのVF端子に接続します。

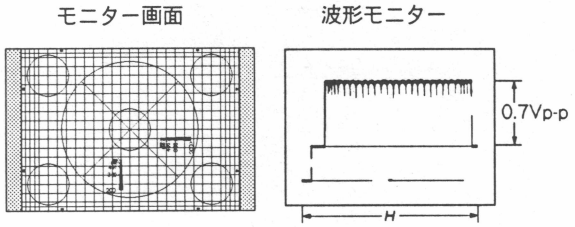
4-4-5. VF画枠調整

注意事項：最初に取り外しておいたLENS ASSYを取り付けてください。
この調整と“4-4-6. フォーカス調整”は相互に影響するので，両者の規格を満足するまで調整してください。

準備

- 完全に調整されたHDVSカメラシステムでレジストレーションチャートを撮像し，レンズズームおよびフォーカスを操作して，チャートのV幅をモニター画面のV幅に一致させます。

被写体：　　レジストレーションチャート



レンズズーム：モニター画枠＝チャート画枠

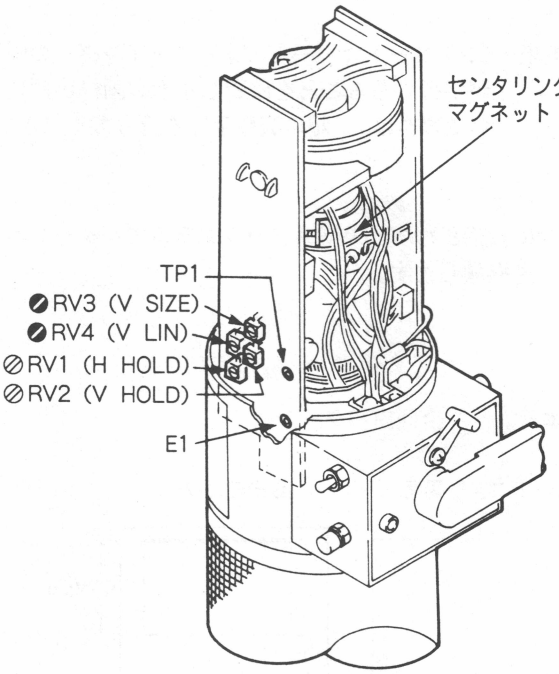
レンズ絞り：　白レベル＝0.7Vp-p

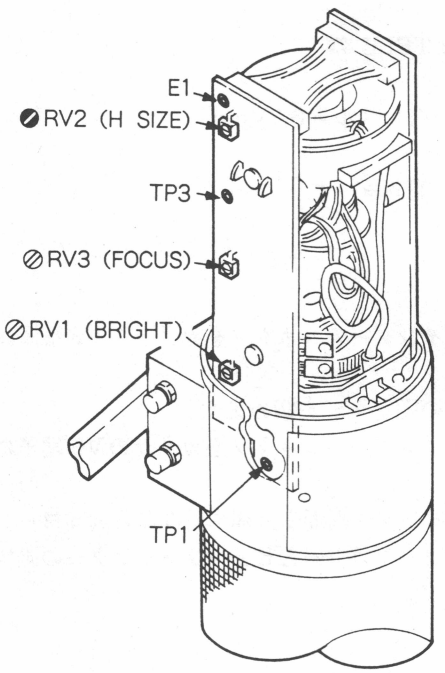
調整箇所：　◐RV2／VF-46基板
◐RV3，◐RV4／VF-47基板

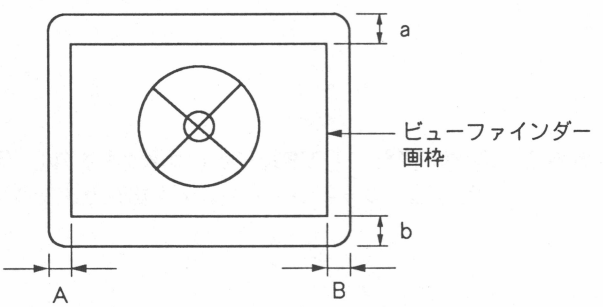
調整手順

1. サイズが最大となる方向に，◐RV3（V SIZE）および◐RV2（H SIZE）を一杯に回します。
2. 偏向ヨークのセンタリングマグネットを回し，レジストレーションチャートがビューファインダー画面の中央になるように調整します。
3. ◐RV2（H SIZE）によって，A＝B（CRTフードサイズ±2％）に調整します。
4. ◐RV3（V SIZE）によって，VサイズをHサイズの9／16に調整します。
5. ◐RV4（V LIN）によって，レジストレーションチャートの中央が真円となるように調整します。
6. 規格が満足するまで，2項～5項を数回繰り返します。

- A＝B（CRTフードサイズ2±1％）
- a＝b（CRTフードサイズ2±1％）







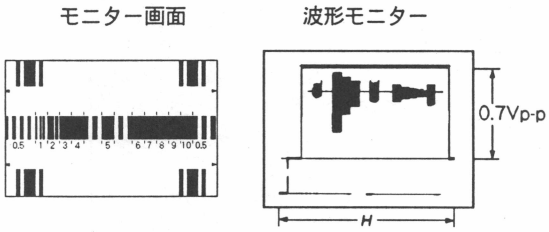
4-4-6. フォーカス調整

注意事項：LENS ASSYを取り付けた状態で調整を行ってください。

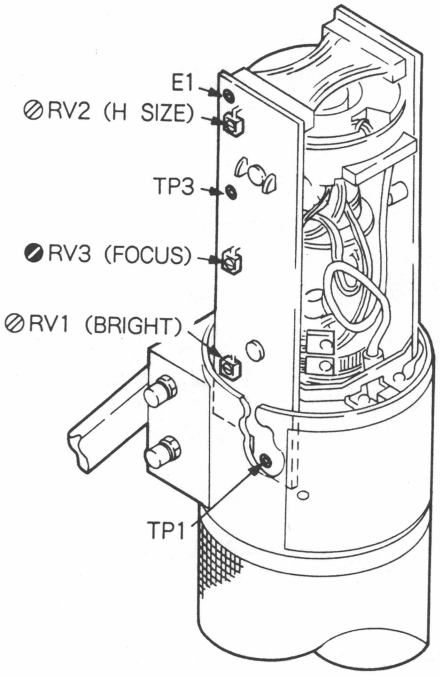
準備

- レジストレーションチャートをバーストチャートに交換し，“4-4-5. VF画枠調整”と同様に設定します。

被写体：バーストチャート

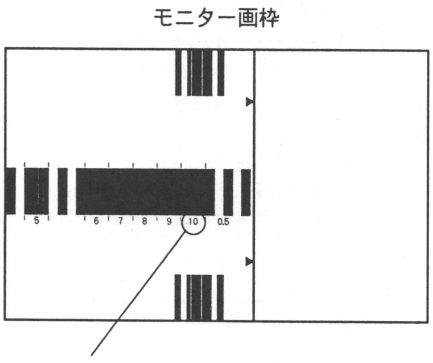


レンズ絞り：　白レベル＝0.7Vp-p



調整手順

1. バーストチャートの10MHz部分が，ビューファインダー画面の中央に位置するようにカメラを設定します。
2. レンズフォーカスでフォーカスを調整します。
3. RV3／VF-46基板によって，フォーカスがさらに良好となるように調整します。



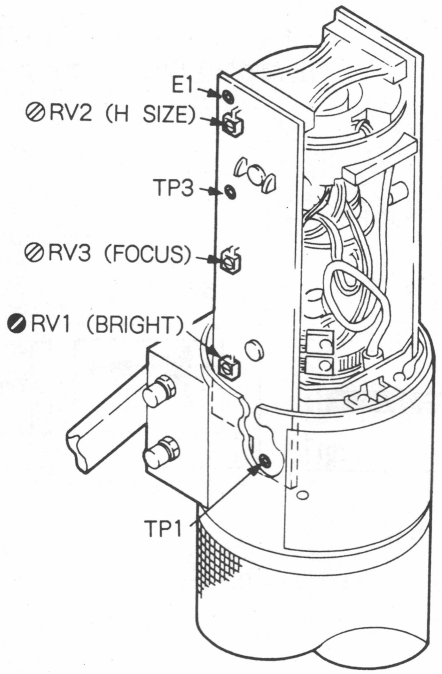
注意事項：調整終了後，“4-4-5. VF画枠調整”を確認してください。

4-4-7. ブライトセット調整

注意事項：LENS ASSYを取り付けた状態で調整を行ってください。

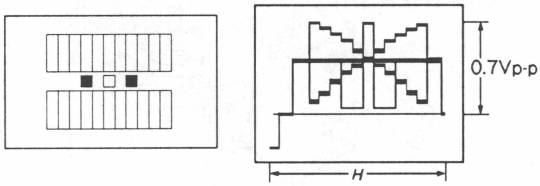
準備

- チャートを11段階グレースケールチャートに交換し，“4-4-5. VF画枠調整”と同様に設定します。



被写体：　　グレイスケールチャート

モニター画面　　波形モニター

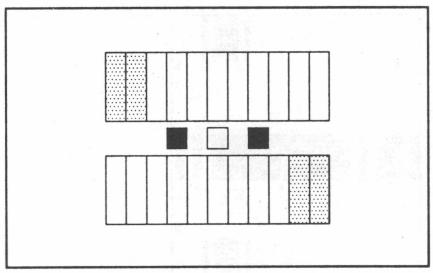


レンズ絞り：　白レベル＝0.7Vp-p

調整手順

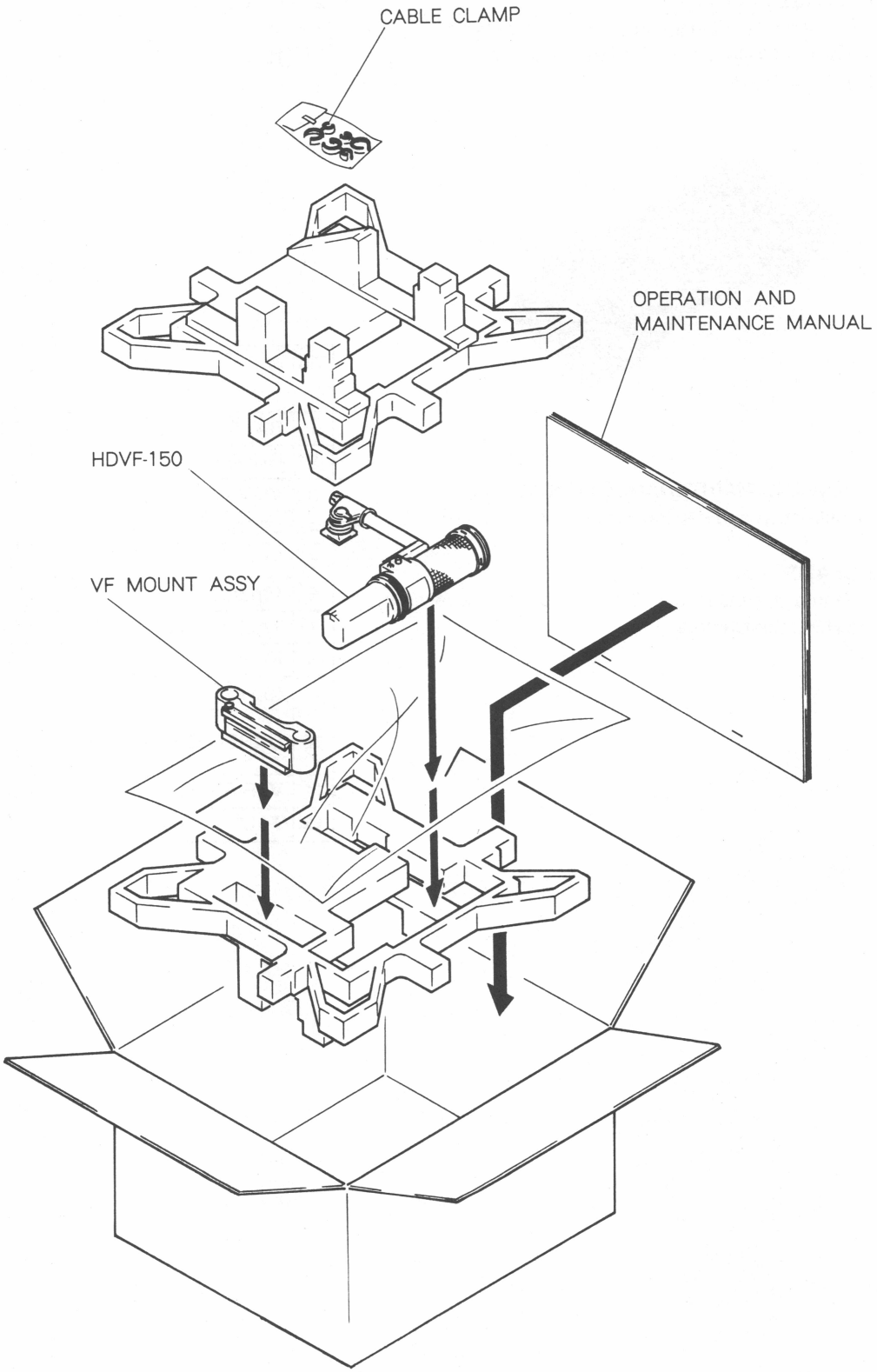
- 11段階グレースケールチャートの1段目と2段目の階調が同一となるように⊘RV1／VF-46基板を調整します。

ビューファインダー画面



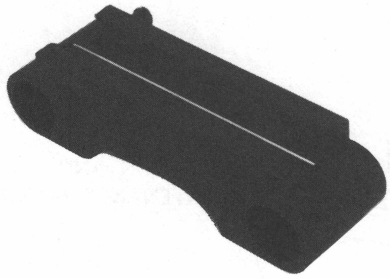
SECTION 2
INSTALLATION

2-1. UNPACKING AND REPACKING



2-2. SUPPLIED ACCESSORIES

VF MOUNT ASSY ×1
Used to install the HDVF-150 on the HD Color Camera.
As for installation, refer to the section 1-3. ATTACHING TO THE VIDEO CAMERA.



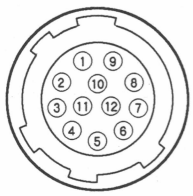
OPERATION AND MAINTENANCE MANUAL ×1
This is a instruction and service manual for the HDVF-150.

CABLE CLAMP ×3
Used to clamp the cable of HDVF-150 on the accessary rod of the HD Color Camera.

2-3. CONNECTORS/CABLE

2-3-1. Connector Input/Output Signals

VF (12, MALE)



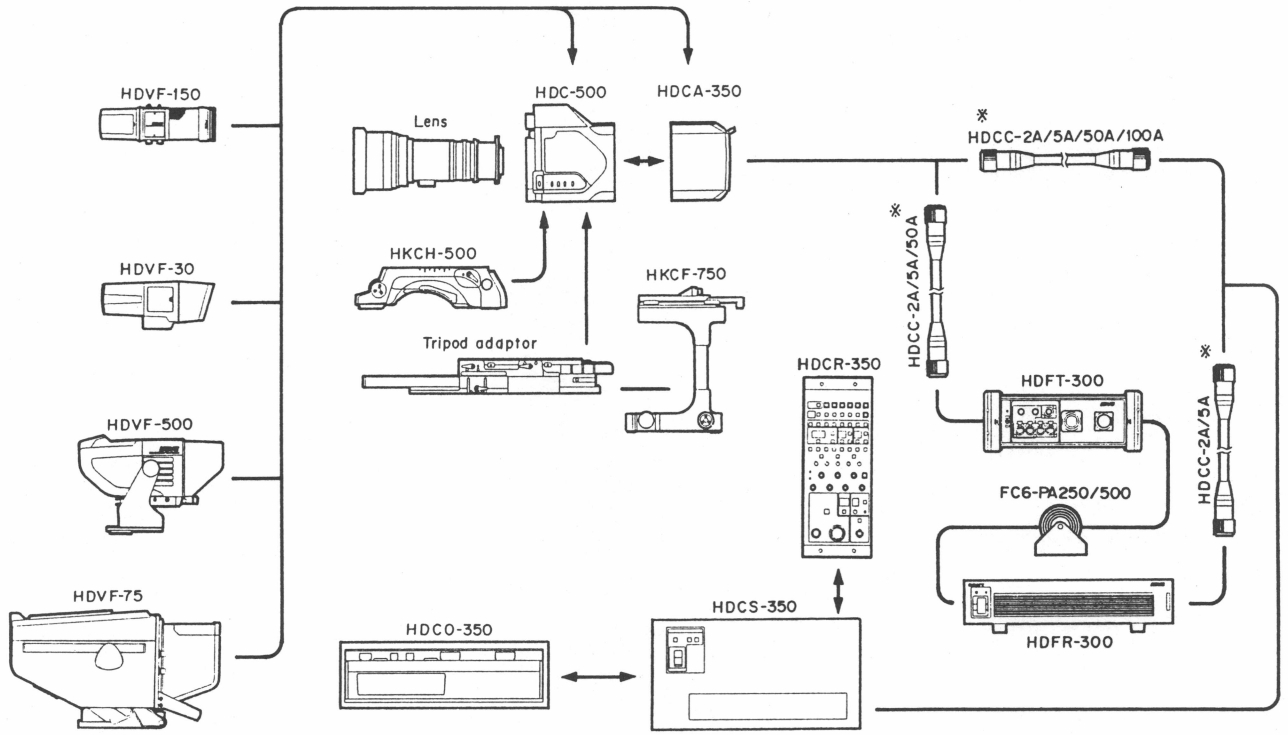
(EXT VIEW)

Pin No.	SIGNAL	REMARK for SIGNAL
1	BATT	DC +5V: ON
2	UNREG(+12V)IN	DC10.5V~17V, 2A
3	VF VIDEO IN(G)	VBS 1Vp-p, 75Ω
4	VF VIDEO IN(X)	
5	PEAKING ON/$\overline{\text{OFF}}$ IN	ON: +5V OFF: 0V
6	(Spare)	
7	TALLY – 1 IN	DC+5V: ON
8	EFFECT	DC+5V: ON
9	(Spare)	
10	UNREG(GND)IN	GND for UNREG (+12V)
11	VTR SAVE	DC+5V: ON
12	TALLY – 2 IN	DC+5V: ON

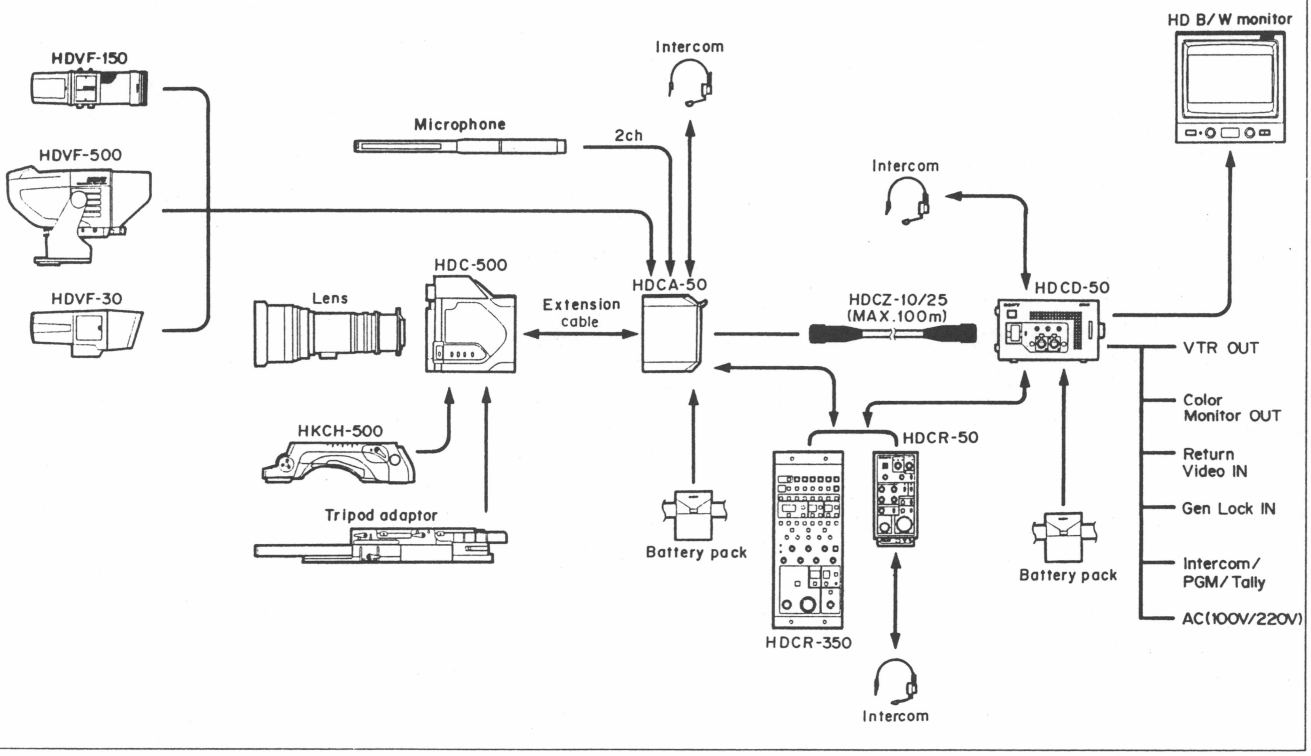
2-4. SYSTEM CONFIGURATION

HDC-500 CCU SYSTEM

※ These cables are compatible with the HDCC-2/5/50/100 cables.

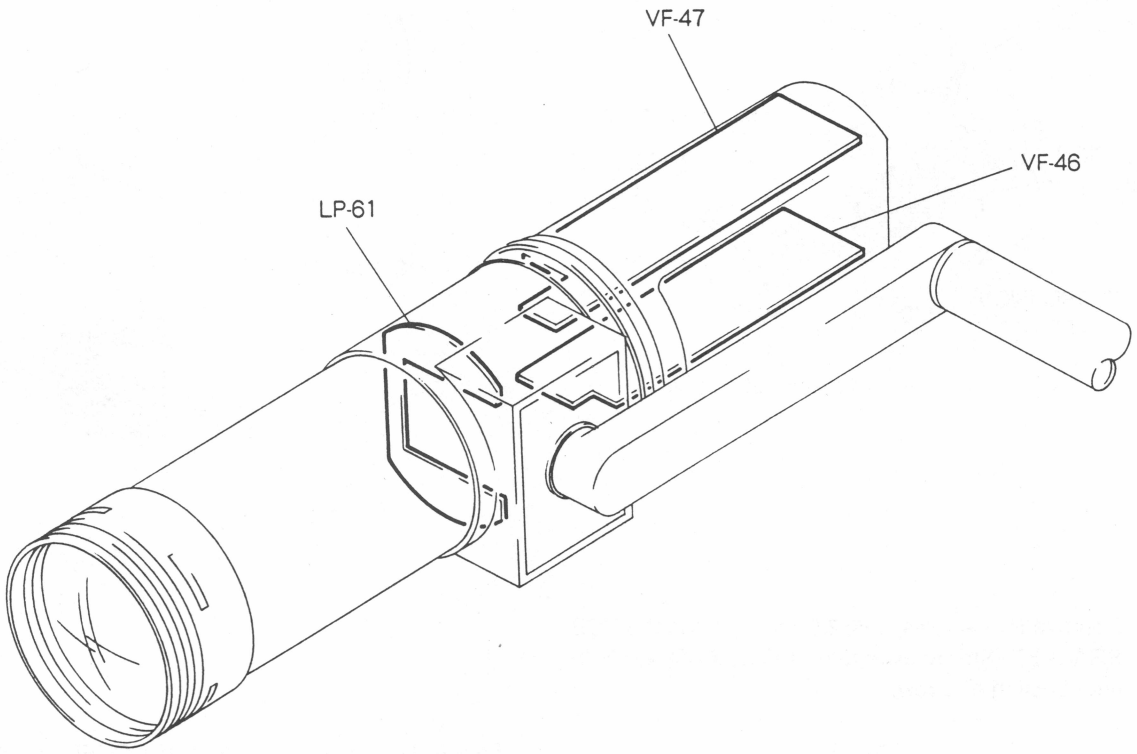


HDC-500 STAND-ALONE SYSTEM



SECTION 3
MAINTENANCE

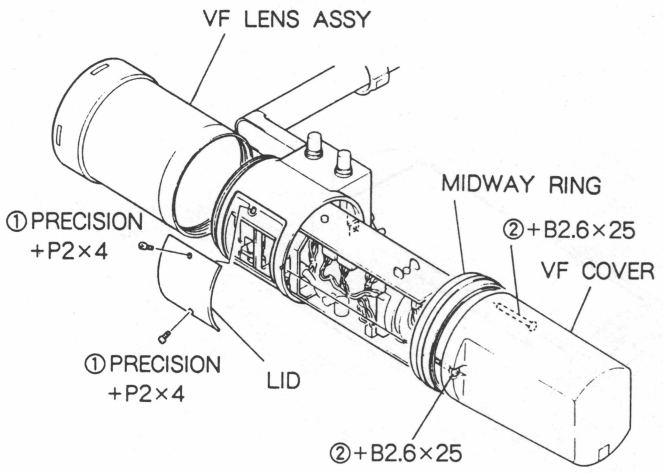
3-1. BOARD LAYOUT



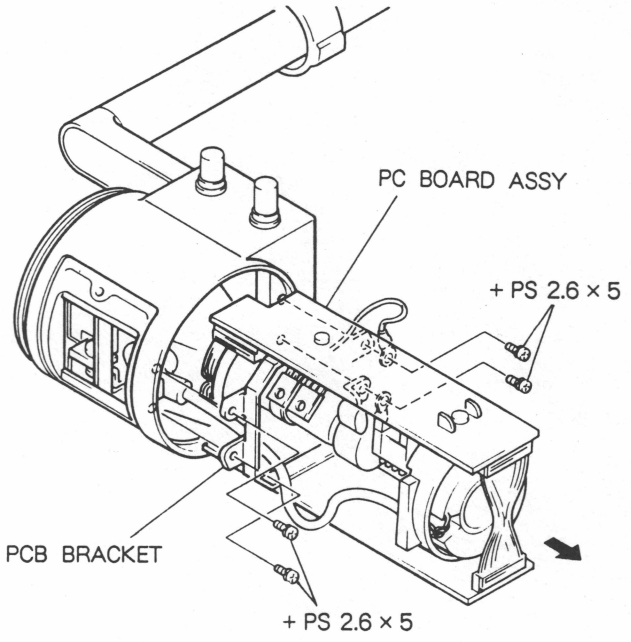
3-2. REPLACEMENT OF CRT AND DEFLECTION YOKE

Step.1 Remove two screws (PRECISION +P2×4) securing the lid and remove the LID.

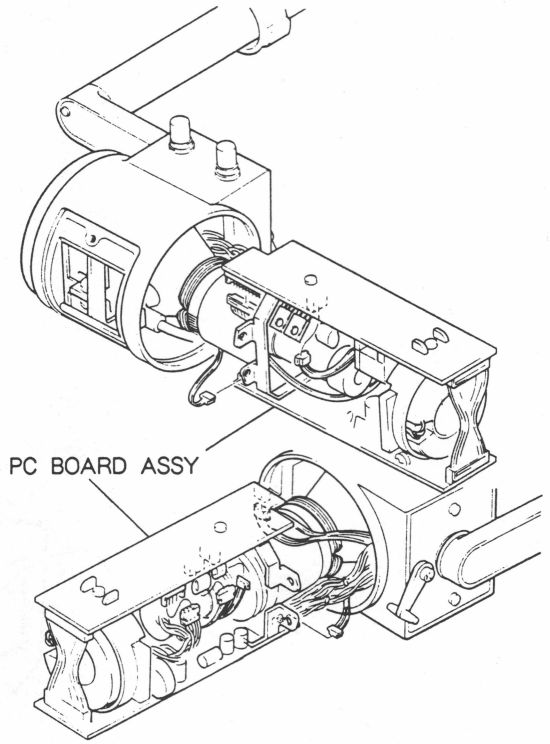
Step.2 Loosen two screws (+B2.6×25) securing the VF COVER and remove the VF COVER.



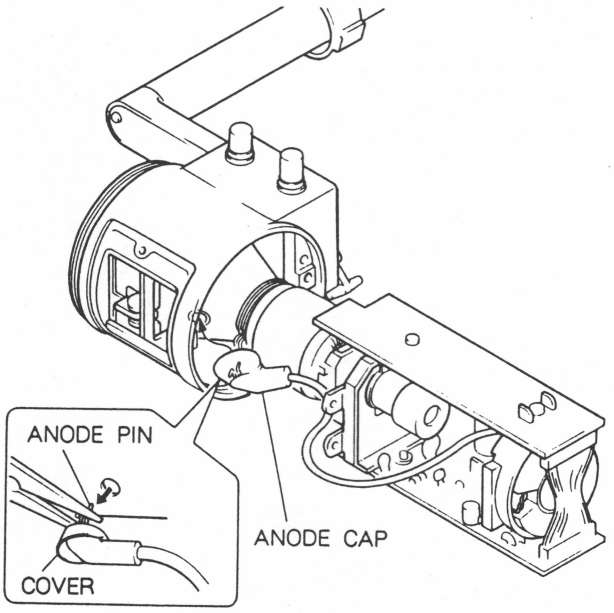
Step3. Remove four screws (+PS2.6×5) securing the PCB BRACKET. Slowly extract the PC BOARD ASSY In the direction of arrow.



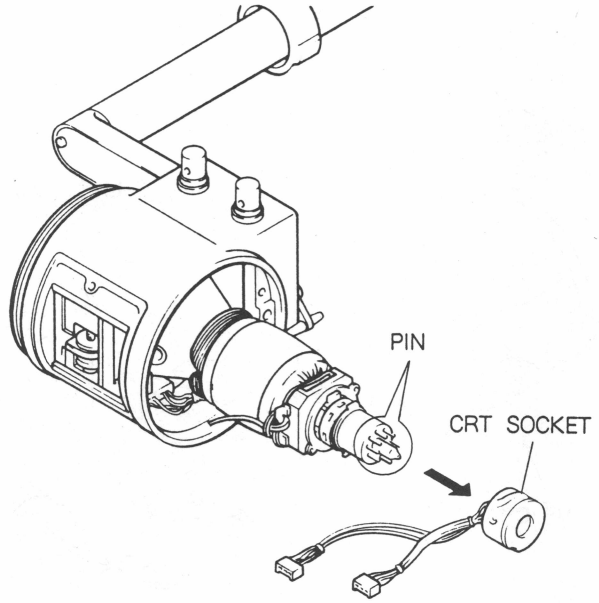
Step.4 Disconnect eight connectors from the right-hand and left-hand sides of PC BOARD ASSY.



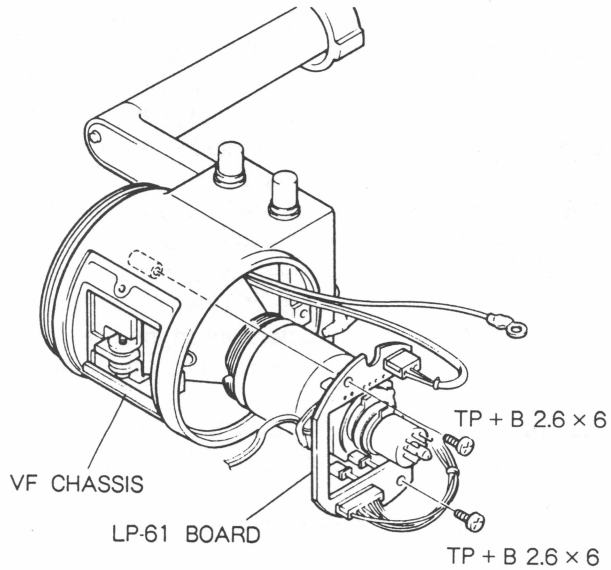
Step.5 Turn up the anode cap COVER as shown in the figure. Then, while using a tweezers to pinch the ANODE PIN, remove the ANODE CAP.



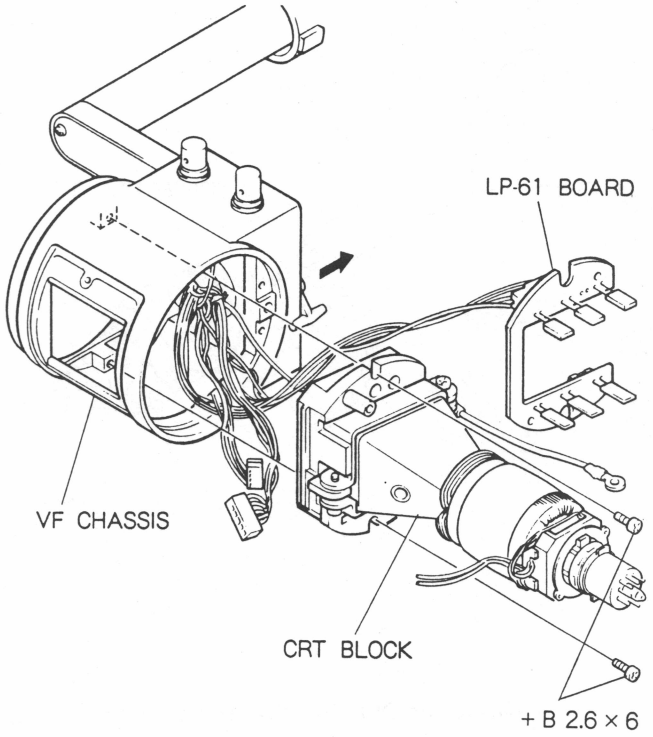
Step.6 Extract the CRT SOCKET by exercising care not to bend the CRT PIN.



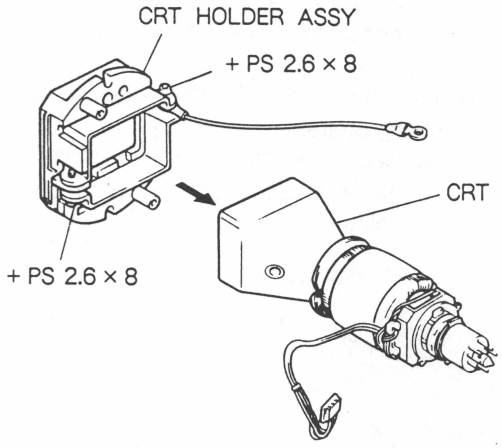
Step.7 Remove two screws (TP+B2.6×6) securing the LP-61 BOARD and extract the LP-61 BOARD from the VF CHASSIS.



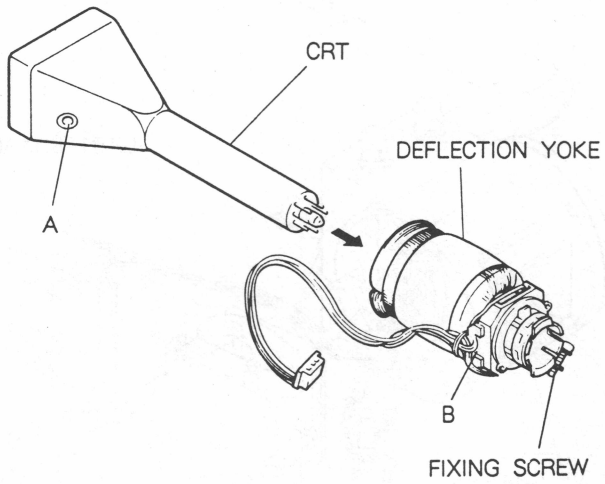
Step.8 Remove two screws (+B2.6×6) securing the CRT BLOCK and extract the CRT BLOCK from the VF CHASSIS.



Step.9 Loosen two screws (+PS2.6×8) securing the CRT HOLDER ASSY and remove the CRT.



Step.10 Loosen a FIXING SCREW securing the DEFLECTION YOKE and remove the DEFLECTION YOKE from the CRT.

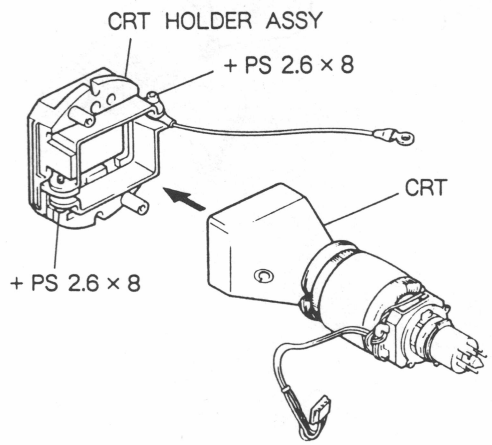


Step.11 Reinstall the DEFLECTION YOKE on the CRT by reversing above Step.10

Note: Cause the anode pin side A of CRT to be positioned at the same side as the DEFLECTION YOKE side B. Also, be sure to insert the DEFLECTION YOKE deeply enough to cause it to contact the CRT base.

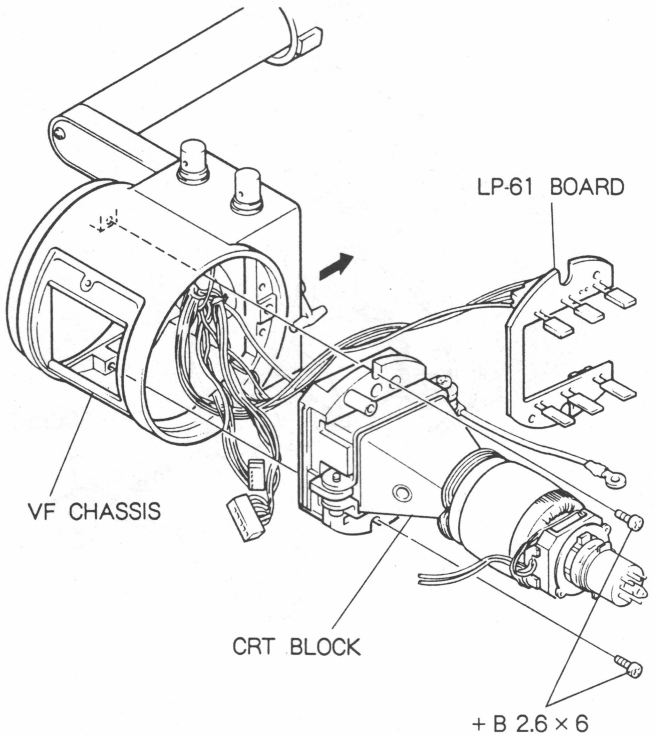
Steo.12 Reinstall the CRT on the CRT HOLDER ASSY by reversing Step9.

Note: Cause the CRT and the CRT HOLDER ASSY to face as shown in the figure below.



Step.13 Insert the CRT BLOCK into the VF CHASSIS by reversing Step 8.

Note: Push the harness extending out from the VF CHASSIS In the direction of arrow.



Step.14 Reinstall the LP-61 BOARD on the CRT HOLDER ASSY in the VF CHASSIS by reversing step 7.

Note: Insert six light-emitting diodes into the recesses of CRT HOLDER ASSY.

Step.15 Insert the CRT SOCKET by reversing Step 6.

Note: Confirm the inserting direction because a key PIN is provided on the CRT SOCKET.

Step.16 Insert the ANODE CAP into the anode terminal of CRT by reversing Step 5.

Step.17 Connect the eight connectors by reversing Step 4.

Note: Positions of the corresponding connectors are determined by colors of connectors and numbers of pins. As for two black 6-pin connectors, insert the one providing the shield wire into the inner-side connector.

Step.18 Reinstall the PC BOARD ASSY in the VF CHASSIS by reversing Step 3.

Note: When inserting the PC BOARD ASSY into the VF CHASSIS, slowly push it in while withdrawing the harness. When the harness is loosely placed inside the VF CHASSIS, the CRT BLOCK may not be installed properly.

Step.19 Install the harness pulled out by Step 18 in between the PC BOARD ASSY and then install the VF COVER, the lid and the VF LENS by reversing Step1.

3-3. PRECAUTIONS ON MAINTENANCE

3-3-1. Precaution on Replacement Parts

(1) Safety Related on Components Warning
Components identified by shading marked and ⚠ marked on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony Parts whose part numbers appear as shown in this manual or in Service bulletins and service manual supplement published by Sony.

(2) Standardization of Parts
Repair parts supplied from Sony Parts Center may not be always identical with the part which actually in use due to "accommodating the improved parts and /or engineering changes" or "standardization of genuine parts". This manual's exploded views and electrical spare parts list are indicating the parts number of "the standardization genuine parts at present".

(3) Stocked of Parts
The parts marked with "S" in the SP column of the exploded views and electrical spare parts list are normally required for routine service work. Order for parts marked with "O" will be processed, but allow for additional delivery time.

(4) Units of Capacitors, Inducutors, and Resistors
The following units are omitted in the schematic diagrams, exploded views, and electrical parts lists unless otherwise specified;
Capacitor : μ F
Inductor : μ H
Resistor : Ω

3-2-2. Precaution on Maintenance

(1) Handle the CRT body and the controls on the neck of the CRT with utmost care and do not apply excessive force to the CRT.

(2) High voltage of 6.5kV and high voltage pulse of 1kV p-p exist on the high voltage and deflection circuits. Take utmost care when checking the unit while it is operating; especially high voltage circuit and deflection circuit. 100V and 1kV power lines are installed on the printed board. Do not touch the printed board with bare hand or tools.

(3) Before touching the CRT for checking purpose or replacing it, cut off the power, remove the high voltage anode cap and discharge the accumulated electricity on the anode to the ground using circuit taster lead, etc.
Disconnect the power cord from the AC power source to prevent possible danger caused by accidental turning on the power.

3-4. TOOLS AND FIXTURES

(Name)	(Sony Parts No.)
Burst Chart	J-6026-110-A
Registration Chart	J-6026-120-A
Pattern Box "PTB-500"	J-6026-140-A
Adjusting Screwdriver	7-700-733-01

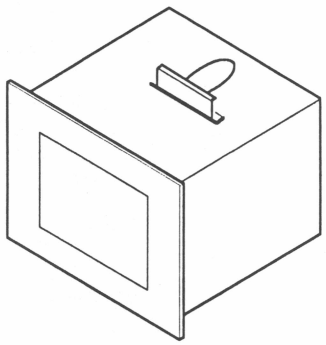
SECTION 4
ALIGNMENT

4-1. EQUIPMENT REQUIRED

- HDVS camera system
  (HDC-500, HDCA-350, HDCO-350, HDCS-350)
- Oscilloscope
  TEKTRONIX model 2465 or equivalent
- HDVS waveform monitor
  TEKTRONIX model 1730HD or equivalent
- HDVS B/W monitor
  Sony model HDM-145 or equivalent

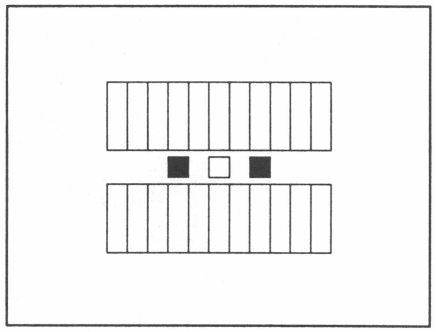
J-6029-140-B	Pattern Box PTB-500

PTB-100 is also available.



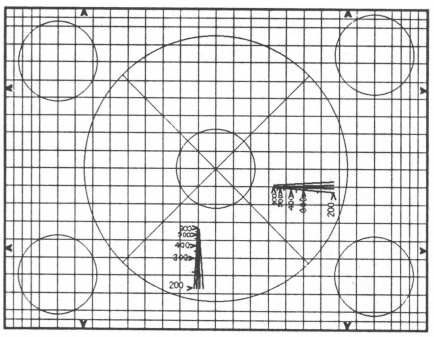
J-6026-130-B	Gray Scale Chart

Stick the velvet(black)at the both sides of white pattern in the center to avoid the light leakage.



J-6026-110-A	Burst Chart

J-6026-120-A	Registration Chart



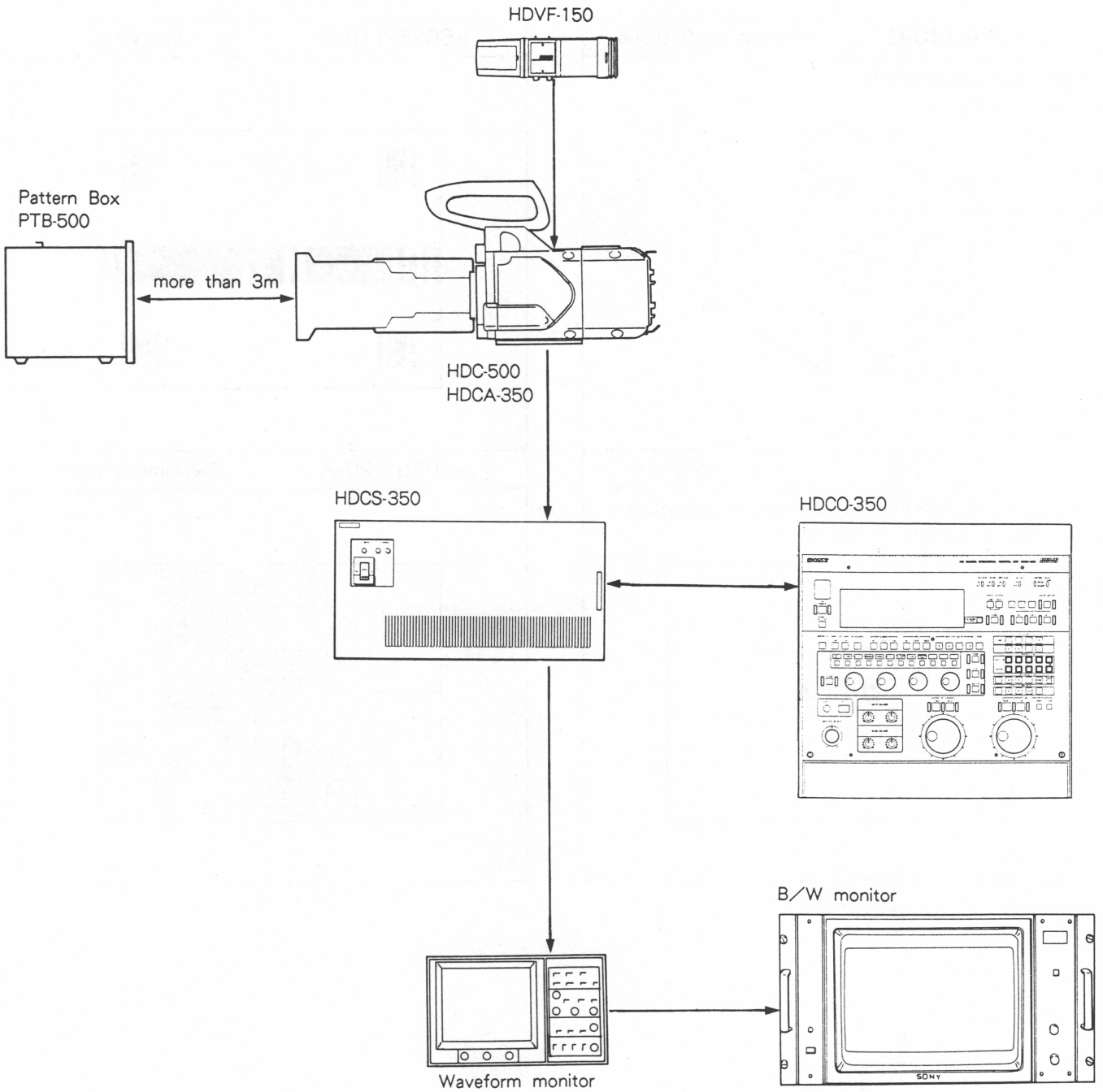
4-2. PREPARATION BEFORE ADJUSTMENT

4-2-1. Notes Before Adjustment

- Adjustment of this unit is carried out by using the completely aligned HDVS camera system (HDC-500, HDCA-350, HDCO-350 and HDCS-350) while observing the conventional test pattern chart.
- Since a high voltage circuit such as deflection circuit has been loaded in this unit, so pay attention to handle the unit.

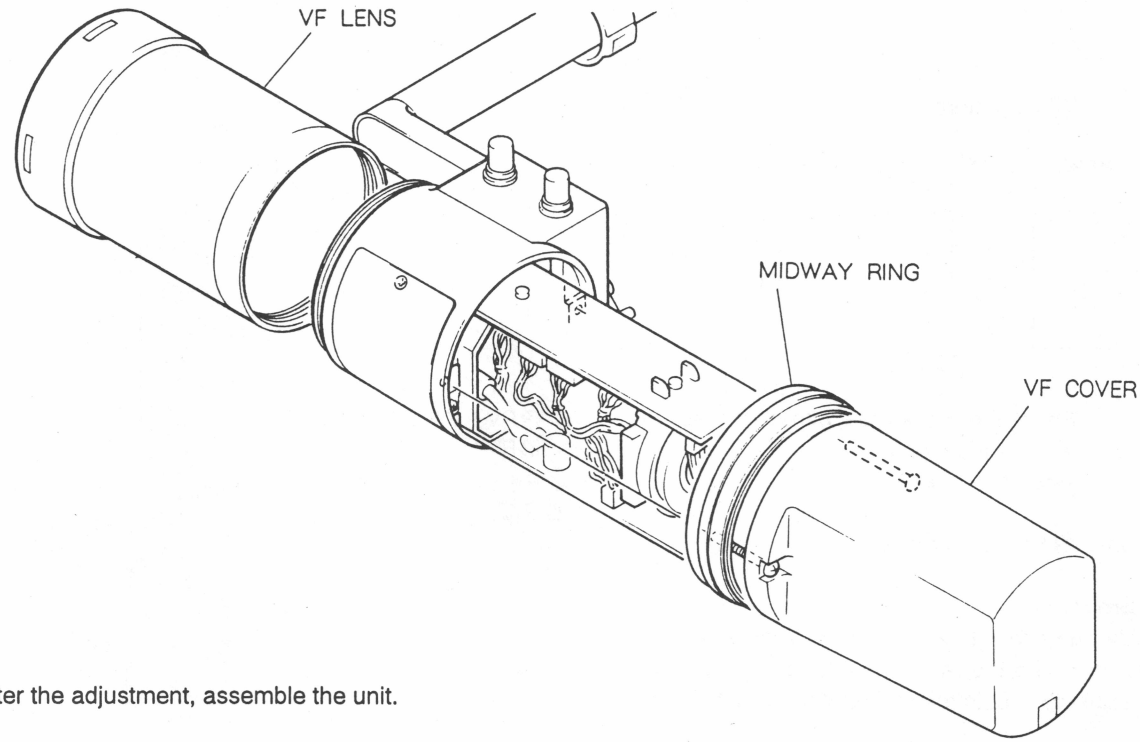
4-2-2. Connections

- Connect HDVS camera system as shown below and set the system for picking up the test pattern picture on the viewfinder screen.



4-2-3. Removal of VF COVER

1. Remove the lens assembly so as to see the viewfinder screen easily.
2. Loosen the fixing screws and remove the VF COVER ASSY.



3. After the adjustment, assemble the unit.

4-3. INITIAL SETTING

Set controls and switch as follows.

⏲ PEAKING control	→ Mechanical center
⏲ BRIGHT control	→ Mechanical center
⏲ CONTRAST control	→ Mechanical center
TALLY switch (viewfinder)	→ OFF

4-4. ADJUSTMENT

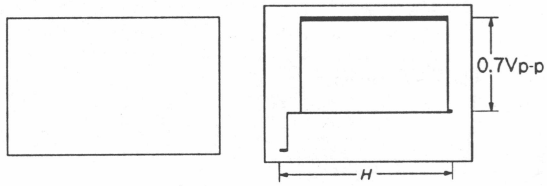
4-4-1. V Hold Adjustment

Preparation:

- Shoot the pattern box using completely aligned HDVS camera system.

Object: White pattern

Monitor screen **Waveform monitor**



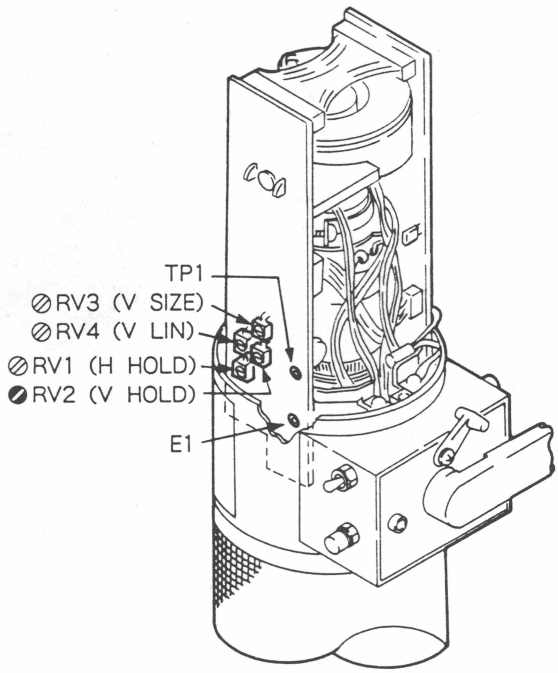
Lens zoom: Shoot the white area with a lens set to the telephoto end.

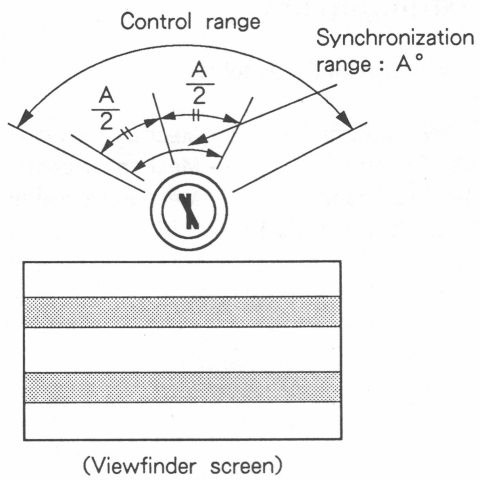
Lens iris: White level=0.7 Vp-p

Adjusting point: ⊘ RV2/VF-47 board

Adjustment procedure

- Turn ⊘ RV2 and find a point where the vertical hold is not stable. Next, find the range where the vertical hold locks and adjust ⊘ RV2 to the mid-rotation in that range.





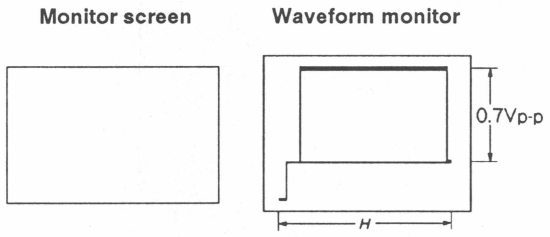
4-4-2. H Hold Adjustment

Equipment: Oscilloscope

Preparation:

- Shoot the pattern box using completely aligned HDVS camera system.

Object: White pattern



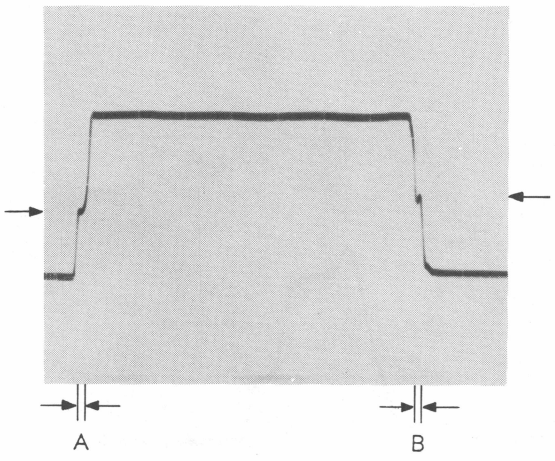
Lens zoom: Shoot the white area with a lens set to the telephoto end.

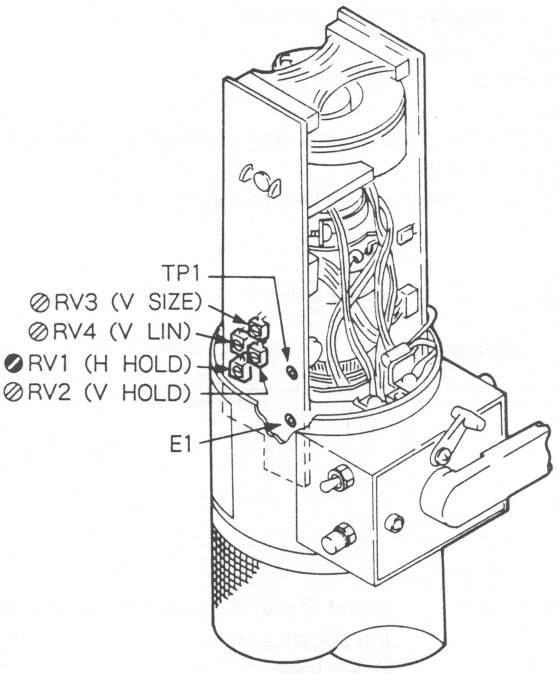
Lens iris: White level=0.7 Vp-p

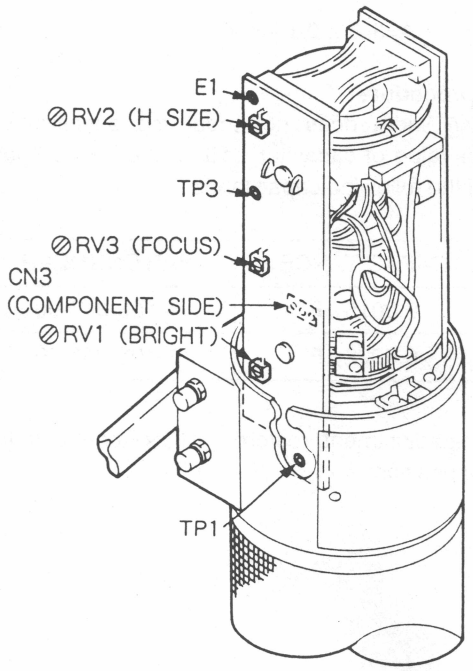
Test point: CN3-2PIN/VF-46 board

Adjusting point: ◐ RV1/VF-47 board

Specification: A=B







4-4-3. Flyback Pulse Width Adjustment

Note: This adjustment should be performed only when the flyback transformer (T2/VF-46 board) or the deflection yoke is replaced.

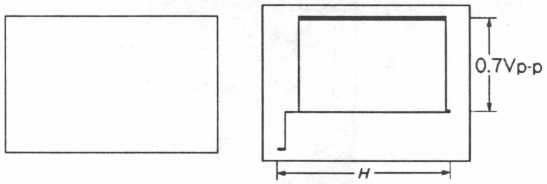
Equipment: Oscilloscope

Preparation:

- Shoot the pattern box using completely aligned HDVS camera system.
- ⏲CONT control → ◯ fully counterclockwise

Object: White pattern

Monitor screen **Waveform monitor**



Lens zoom: Shoot the white area with a lens set to the telephoto end.

Lens iris: White level=0.7 Vp-p

Test point: TP3/VF-46 board

Adjusting point: Capacitor (C19)

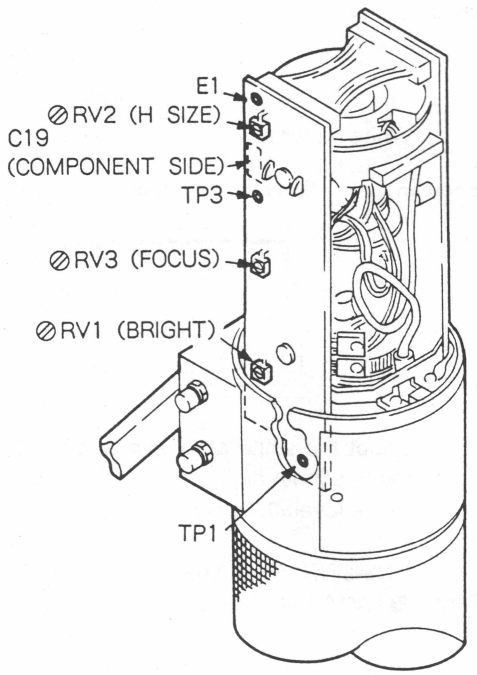
Specification: A=3.2 ± 0.1 µsec

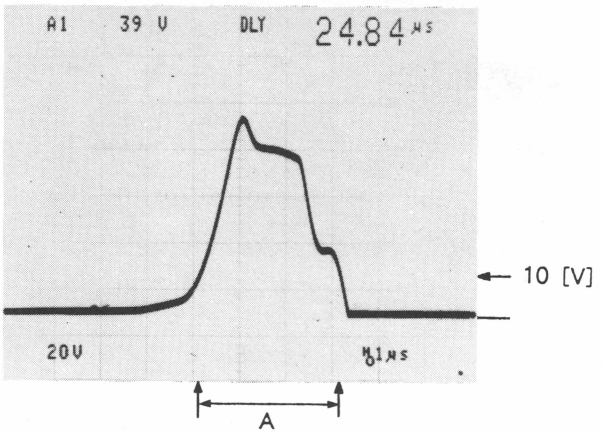
Adjustment procedure

- If the pulse width does not meet the specification, change the value of capacitor C19 on the VF-46 board with any of the following capacitance.

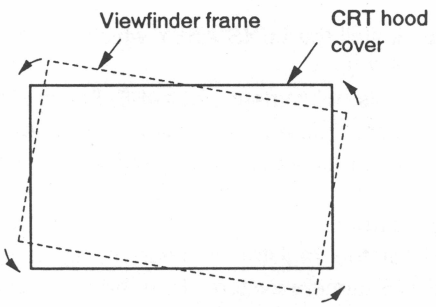
	CAPACITANCE	PART NUMBER
C19	0.0015 µF	1-106-347-00
	0.0022 µF	1-106-351-00

Note: After the adjustment, restore ⏲CONT control to the original position.





4-4-4. Deflection Yoke Tilt Adjustment

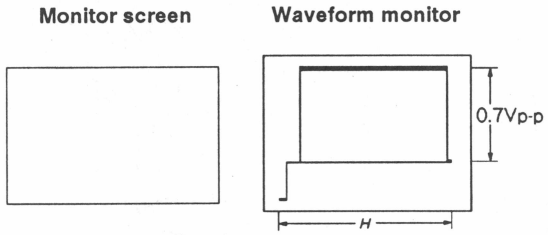


Note: The CRT hood cover must be positioned in parallel with the viewfinder frame.
If not, perform the following adjustment, removing the diopter adjusting section in order to check easily.

Preparation:

- Shoot the pattern box using completely aligned HDVS camera system.

Object: White pattern

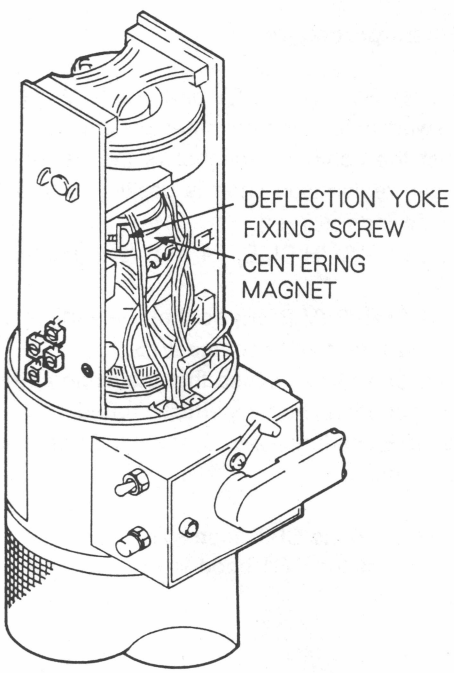


Lens zoom: Shoot the white area with a lens set to the telephoto end.
Lens iris: White level=0.7 Vp-p

Adjusting point: Deflection yoke

Adjustment procedure

1. Disconnect the VF connector from the camera.
2. Loosen the deflection yoke fixing screw.
3. Connect the VF connector to the camera.
4. While observing the upper part of the viewfinder screen, rotate the deflection yoke so that the CRT hood cover is positioned in parallel to the viewfinder frame.



Note: After the adjustment, disconnect the VF connector once, and tighten the deflection yoke fixing screw. Connect the VF connector to the camera.

4-4-5. VF Picture Frame Adjustment

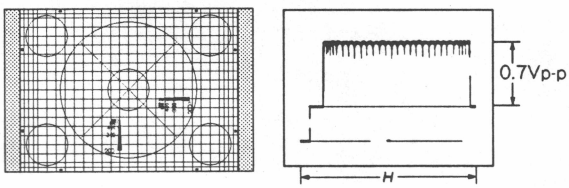
Note: Install the LENS ASSY which is removed in Section 4-2-3.
This adjustment and 4-4-6. Focus Adjustment affect each other, so carry out these adjustments alternately until both specifications are satisfied.

Preparation:

- Shoot the registration chart using completely aligned HDVS camera system. Turn the zoom control and focus control of the lens so that the vertical width of the chart is alighed with the vertical width of the monitor's picture frame.

Object: Registration chart

Monitor screen **Waveform monitor**



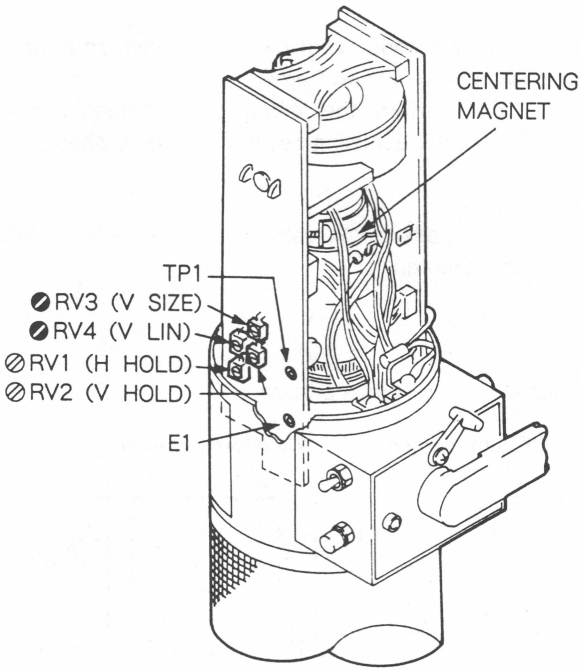
Lens iris: White level=0.7 Vp-p

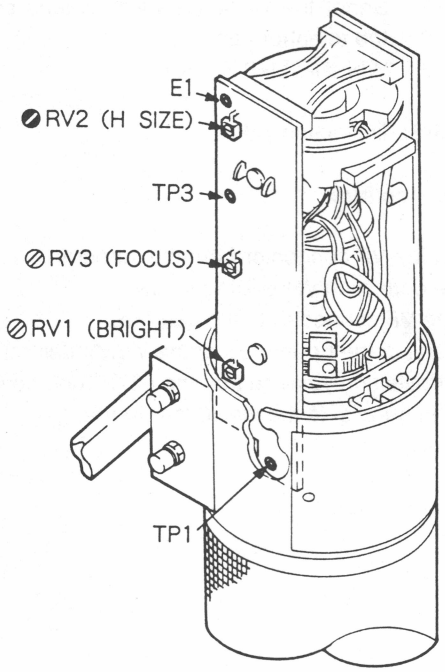
Adjusting point: ⊘ RV2/VF-46 board
⊘ RV3, ⊘ RV4/VF-47 board

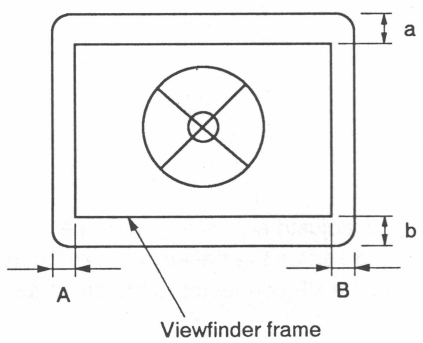
Adjustment procedure

1. Turn ⊘ RV3 (V SIZE) and ⊘ RV2 (H SIZE) fully clockwise until frame becomes maximum.
2. Adjust the centering magnet of the deflection yoke so that the registration chart is positioned to the center of the viewfinder screen.
3. Adjust ⊘ RV2 (H SIZE) for A=B (2 ± 1% the CRT hood size).
4. Adjust ⊘ RV3 (V SIZE) so that the vertical size against the horizontal size becomes 9/16.
5. Adjust ⊘ RV4 (V LIN) so that the circle at the center of the registration chart is perfectly round.
6. Repeat Procedures 2 to 5 several times until meet the specifications.

- A=B (2 ± 1% the CRT hood size)
- a=b (2 ± 1% the CRT hood size)







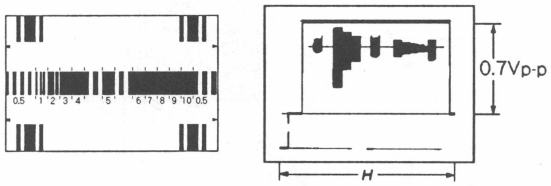
4-4-6. Focus Adjustment

Preparation:

- Change the registration chart to the burst chart, and set the camera head similar manner of 4-4-5.

Object: Burst chart

Monitor screen **Waveform monitor**

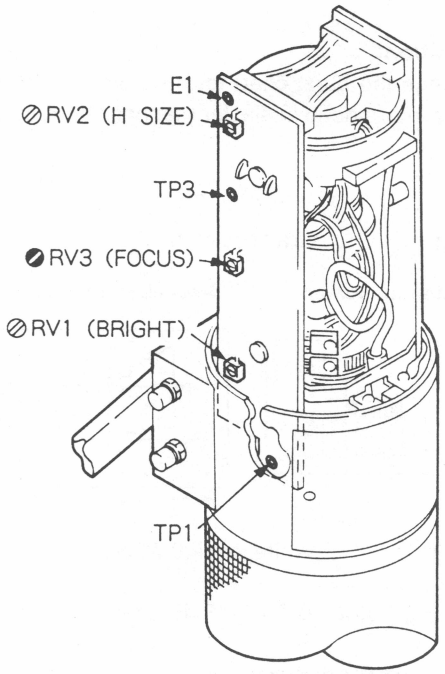


Lens iris: White level=0.7Vp-p

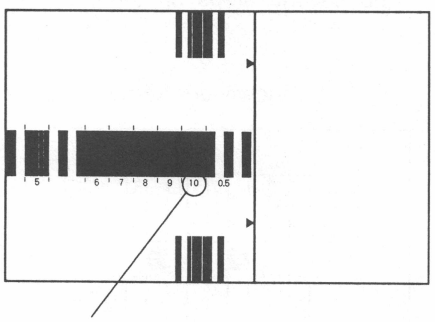
Adjusting point: ⊘ RV3/VF-46 board

Adjustment procedure

1. Pan the camera head and set it to position where the 10MHz portion of the burst chart appears at the center of the viewfinder screen.
2. Adjust the focus with focus control.
3. Adjust ⊘ RV3 on the VF-46 board for the best possible focus.



Monitor frame



Adjust so that the 10 MHz point appears at the center of the screen.

Note: After the adjustment, confirm specification in 4-4-5. VF Picture Frame Adjustment is satisfied.

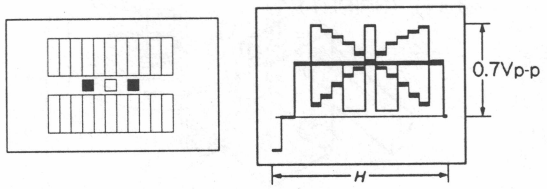
4-4-7. Bright Set Adjustment

Preparation:

- Change the burst chart to the gray scale chart, and set the camera head in similar manner of 4-4-5.

Object: Gray scale chart

Monitor screen **Waveform monitor**



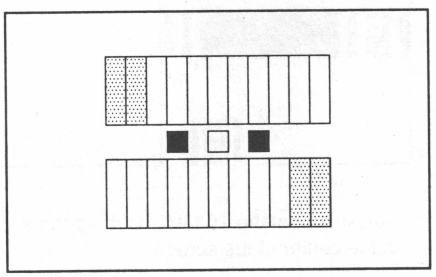
Lens iris: White level=0.7Vp-p

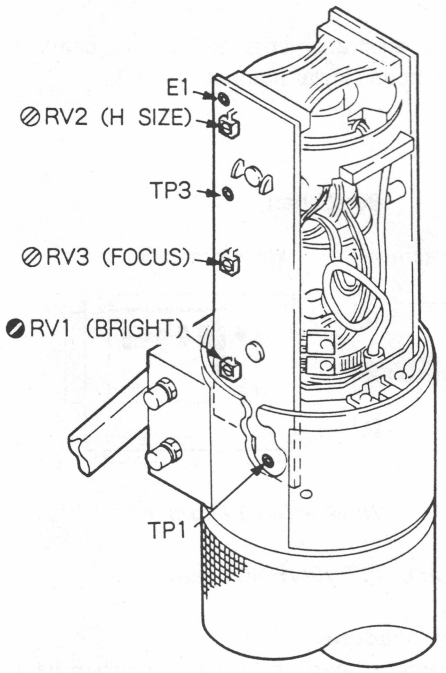
Adjusting point: ⊘ RV1/VF-46 board

Adjustment procedure

- Adjust ⊘ RV1 on the VF-46 board so that the gradation of first and second steps on the gray scale chart is equal.

Viewfinder frame

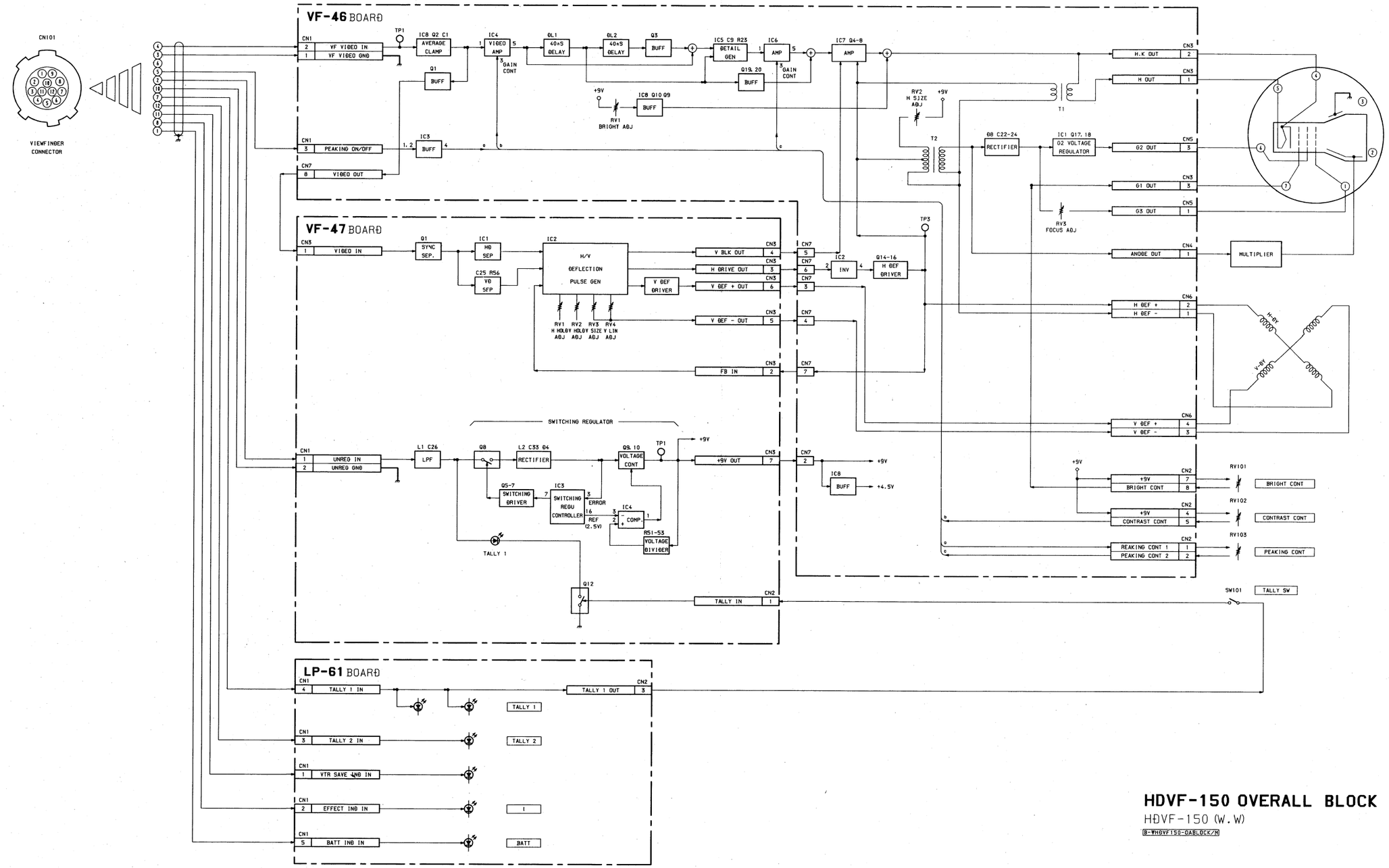




OVERALL	OVERALL

SECTION A
BLOCK DIAGRAM

OVERALL BLOCK



HDVF-150 OVERALL BLOCK

HDVF-150 (W.W)

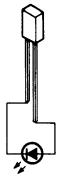
B-WHDVF150-0ABLOCK/M

SECTION B
SEMICONDUCTOR PIN ASSIGNMENT

The circuit diagram of IC is obtained from the IC data book published by the manufacturer.

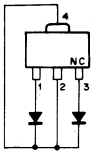
(SCALE 4/1)
TOP VIEW

02CZ ? ?
RD ? ?M

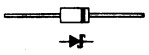


AA4553K ; ORANGE
BR4553K ; RED
PG4553KY ; GREEN

TOP VIEW (SCALE 4/1)

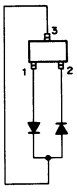


EA30QS04-F

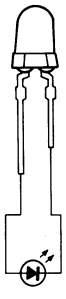


ES1F

(SCALE 4/1)
TOP VIEW

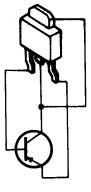


MA143

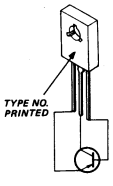


TLRA160 ; RED

V09C

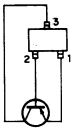


2SA1244LB



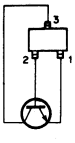
2SA1406

(SCALE 4/1)
TOP VIEW

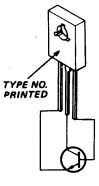


2SA1610
2SA1611

(SCALE 4/1)
TOP VIEW

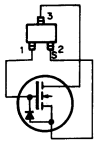


2SC1622A
2SC3734
2SC4176
2SC4177
2SC4412

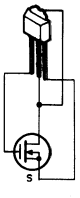


2SC3600

TOP VIEW
(SCALE 4/1)

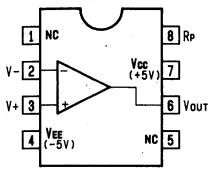


2SK1374

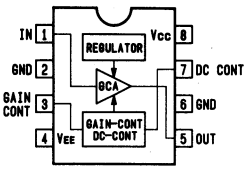


2SK430L

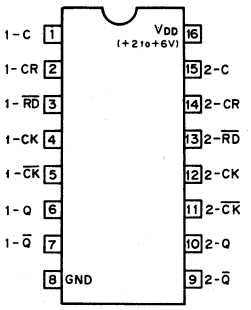
CLC505AJE (COMLINEAR)
FLAT PACKAGE
OPERATIONAL AMPLIFIER
– TOP VIEW –

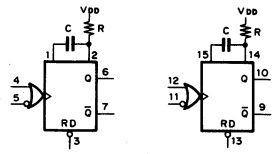


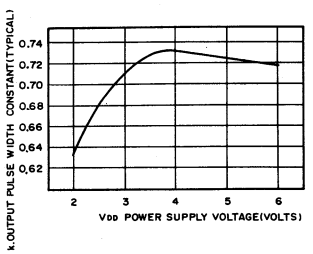
CXA1521M (SONY)
GAIN CONTROL AMP
– TOP VIEW –



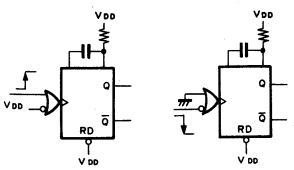
TC74HC4538AF (TOSHIBA) FLAT PACKAGE
C - MOS DUAL RETRIGGERABLE / NON - RETRIGGERABLE MONOSTABLE MULTIVIBRATOR
– TOP VIEW –



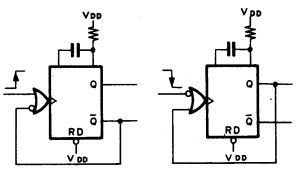




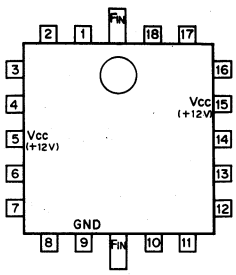
RETRIGGERABLE M.M.V

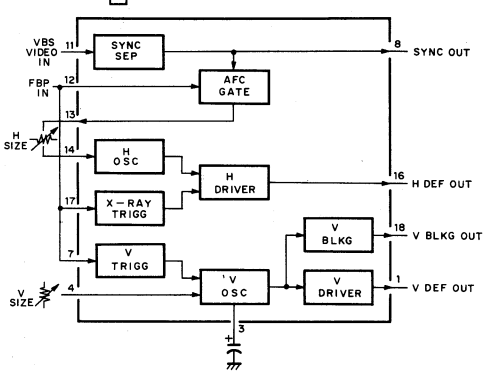


NON-RETRIGGERABLE M.M.V

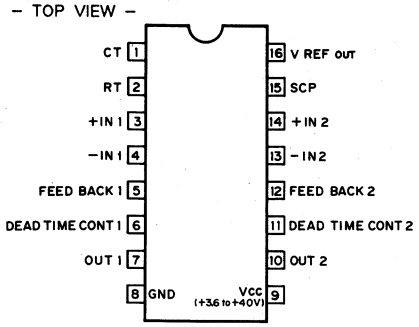


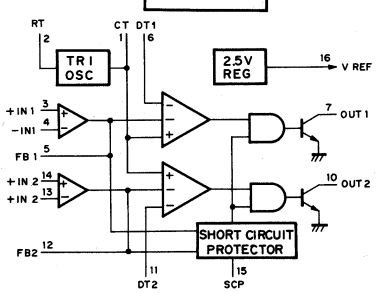
HA11423MP (HITACHI) FLAT PACKAGE
TV H/V SYNC SIGNAL PROCESSOR
– TOP VIEW –



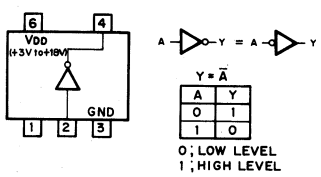


TL1451ACNS (TI) FLAT PACKAGE
DUAL PWM POWER CONTROLLER
– TOP VIEW –





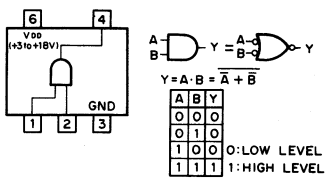
TC4S69F (TOSHIBA) FLAT PACKAGE
C-MOS INVERTER BUFFER
– TOP VIEW –



A	Y
0	1
1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL

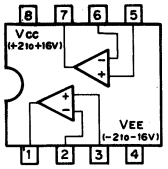
TC4S81F (TOSHIBA) FLAT PACKAGE
C-MOS 2-INPUT AND GATE
– TOP VIEW –



A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

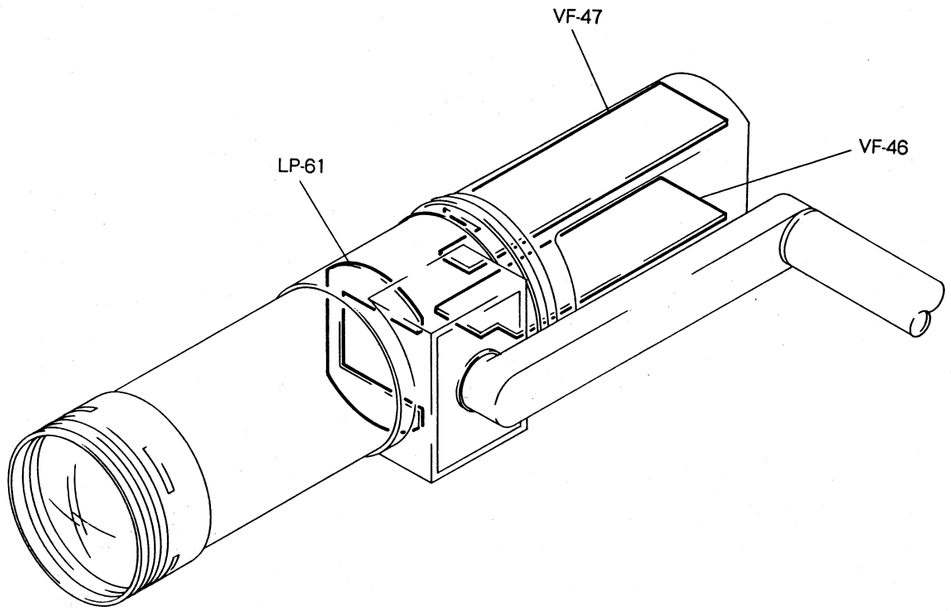
0:LOW LEVEL
1:HIGH LEVEL

UPC4062G2 (NEC) FLAT PACKAGE
TTL-DUAL OPERATIONAL AMPLIFIER WITH LOW POWER CONSUMPTION
– TOP VIEW –



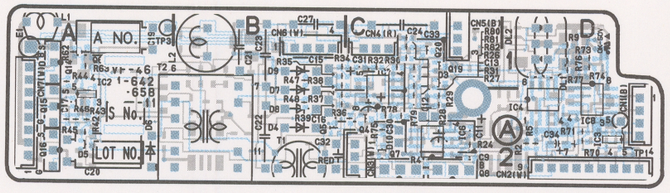
SECTION C
SCHEMATIC DIAGRAMS AND BOARD ILLUSTRATIONS

BOARD LAYOUT

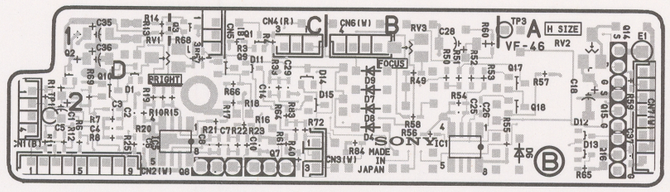


C-1

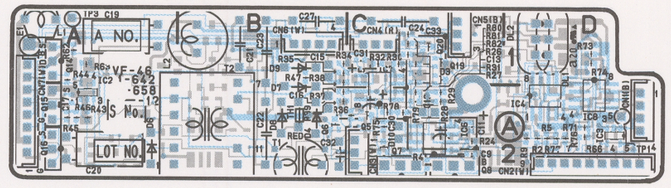
VF-46 BOARD



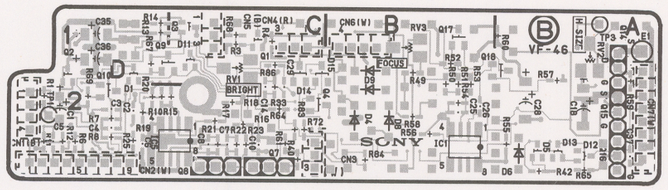
1-642-658-11 COMPONENT SIDE



1-642-658-11 SOLDERING SIDE

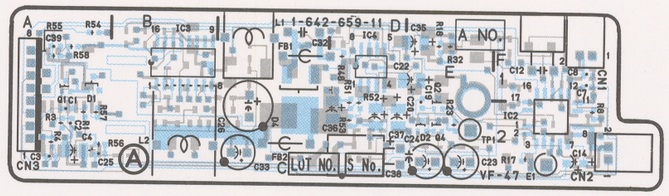


1-642-658-12 COMPONENT SIDE

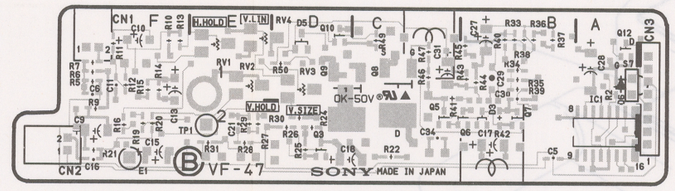


1-642-658-12 SOLDERING SIDE

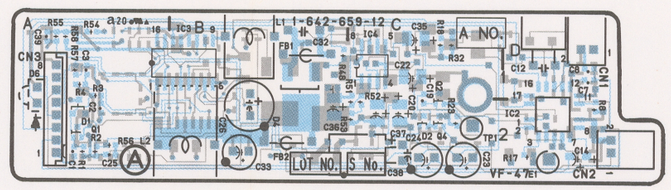
VF-47 BOARD



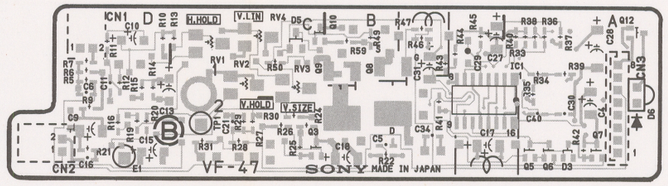
1-642-659-11 COMPONENT SIDE



1-642-659-11 SOLDERING SIDE

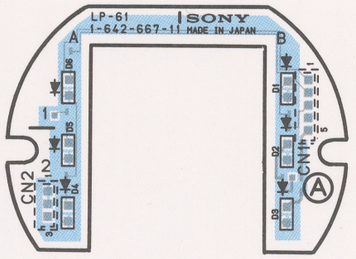


1-642-659-12 COMPONENT SIDE

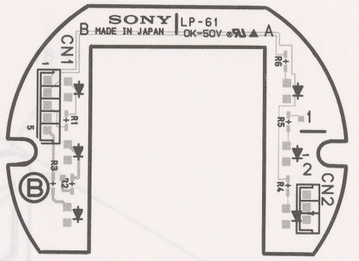


1-642-659-12 SOLDERING SIDE

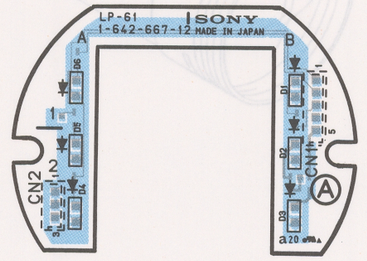
LP-61 BOARD



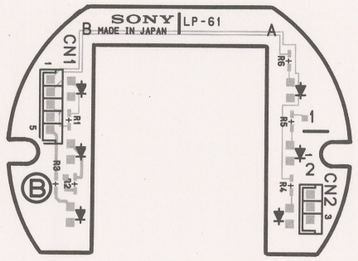
1-642-667-11 COMPONENT SIDE



1-642-667-11 SOLDERING SIDE



1-642-667-12 COMPONENT SIDE



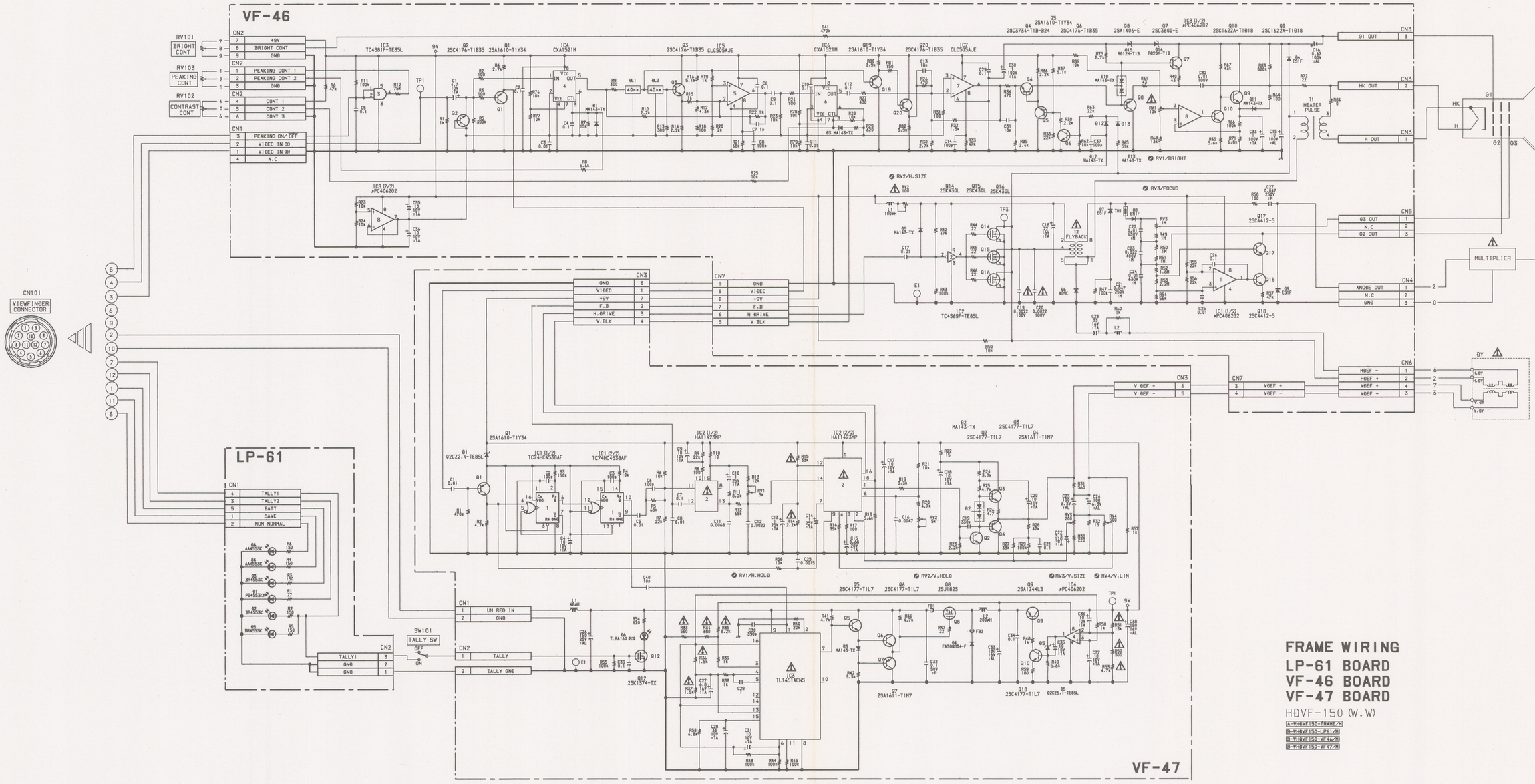
1-642-667-12 SOLDERING SIDE

FRAME

LP-61 BOARD

VF-46 BOARD

VF-47 BOARD



SECTION D
SPARE PARTS

PARTS INFORMATION

1. **Safety Related Component Warning**

   Components identified by shading marked with ⚠ on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose parts numbers appear as shown in this manual or in service manual supplements published by Sony.

2. Replace parts that are supplied from Sony Parts Center can sometimes have different shape and external appearance than what are actually used in equipment. This is due to"accommodating the improved parts and/or engineering changes" or"standardization of genuine parts."
   - This manual's exploded view and electrical spare parts lists are indicating the parts numbers of "the standardized genuine parts at present."
   - Regarding engineering parts and diagrams changes in our engineering department, refer to Sony service bulletins and service manual supplements.

3. The parts marked with"S" in the SP column of the exploded views and electrical spare parts list are normally required for routine service work. Orders for parts marked with "O" will be processed, but allow for additional delivery time.

4. Item with no parts number and/or no description are not stocked because they are seldom required for routine service.

5. All capacitors are in micro farads unless otherwise specified.
   All inductors are in micro henries unless otherwise specified.
   All resistors are in ohms.

EXPLODED VIEW

OVERALL BLOCK

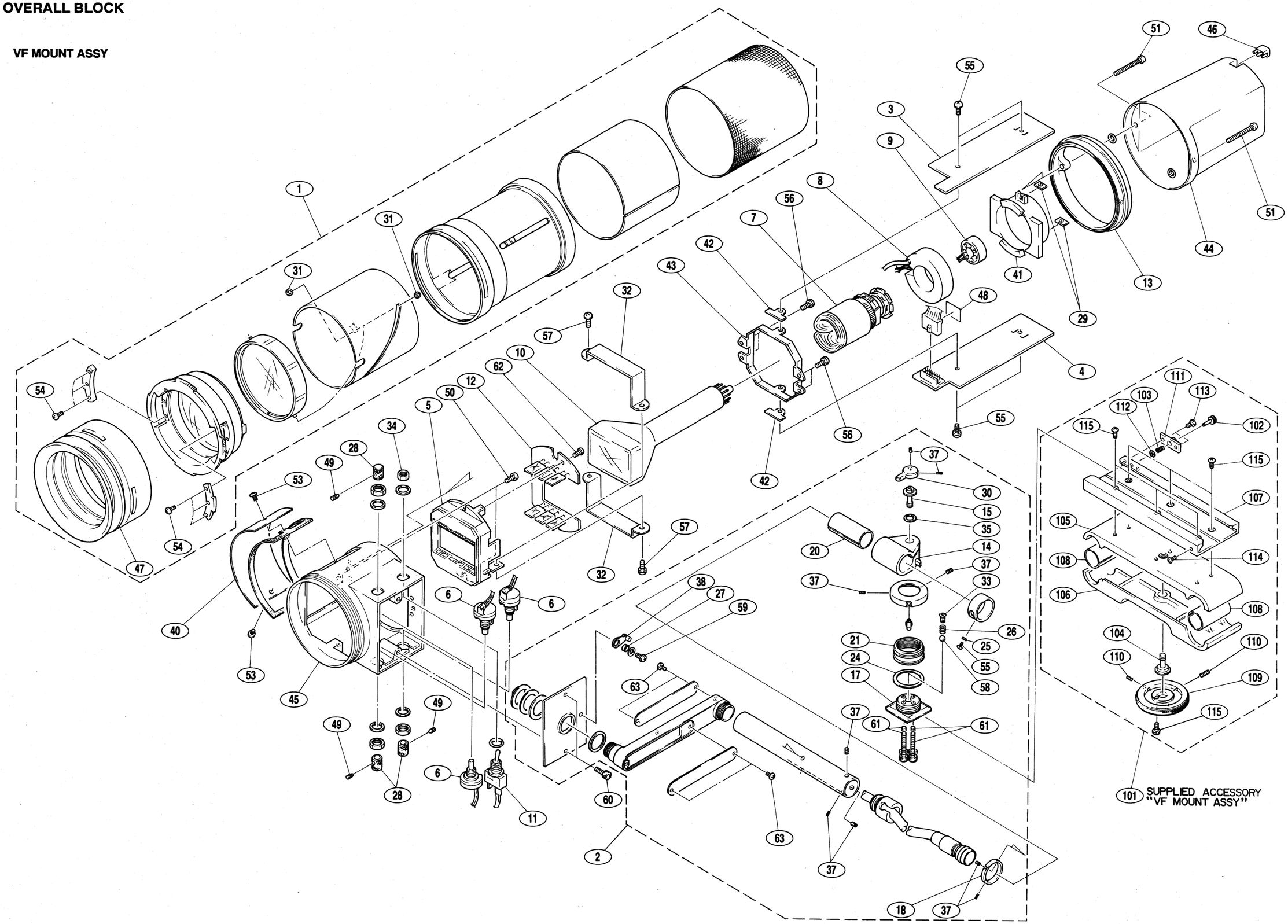
No.	Part No.	SP	Description
1	A-7612-305-B	o	LENS ASSY, VF
2	A-8262-359-A	o	ARM ASSY, VF
3	A-8271-196-A	o	MOUNTED CIRCUIT BOARD, VF-47
4	A-8271-197-A	o	MOUNTED CIRCUIT BOARD, VF-46
5	X-3166-621-2	o	HOLDER ASSY, CRT
6	1-226-736-00	s	RES, VAR, CARBON 250K
7	⚠1-451-330-21	s	DEFLECTION YOKE, VF (HD)
8	⚠1-464-168-22	s	MULTIPLIER
9	1-526-540-22	s	SOCKET, PICTURE TUBE
10	⚠1-546-077-11	s	PICTURE TUBE
11	1-554-924-11	s	SWITCH, TOGGLE (SHORT TOGGLE)
12	1-642-667-12	o	PRINTED CIRCUIT BOARD, LP-61
13	3-175-393-01	o	RING, MIDWAY
14	3-175-751-02	o	ROTARY BLOCK
15	3-175-752-01	o	SHAFT (A), SCREW
17	3-175-754-01	o	SHOE, VF
18	3-175-755-01	o	RING, RETAINING
20	3-176-955-01	o	SLEEVE (1)
21	3-176-956-01	o	RING (A)
24	3-176-959-01	o	SHEET, RING
25	3-539-818-00	s	COLLAR
26	3-641-622-00	s	SPRING, COMPRESSION
27	3-654-058-11	o	SPACER (3X2)
28	3-657-627-11	s	KNOB (2)
29	3-673-015-00	o	PLATE, NUT (M2.6)
30	3-673-046-00	s	LEVER, LOCK
31	3-678-659-00	o	ROLLER
32	3-680-594-01	o	CLAMP, CRT
33	3-682-760-01	o	SCREW (M7-0.75), ADJUSTMENT
34	3-685-104-01	s	NUT (M6), CONTROL
35	3-701-446-21	s	WASHER, 8
37	3-701-505-00	s	SET SCREW, DOUBLE POINT 3X3
38	3-716-206-01	o	PIN, STOP
40	3-716-222-11	o	LID
41	3-716-223-01	o	HOLDER, MP
42	3-716-224-01	o	SHEET, INSULATING, PCB BRACKET
43	3-716-225-01	o	BRACKET, PCB
44	3-716-232-11	o	COVER, VF
45	3-716-234-11	o	CHASSIS, VF
46	3-716-235-01	o	COVER
47	3-716-241-01	o	EYE CUP (B)
48	3-716-242-01	o	INSULATOR
49	7-621-732-08	s	SET-SCT, HEX. 2X3 FLAT POINT
50	7-621-773-95	s	SCREW +B 2.6X6
51	7-621-775-30	s	SCREW +B 2.6X25
53	7-627-553-47	s	SCREW, PRECISION +P 2X4
54	7-627-553-68	s	SCREW, PRECISION +P 2X6
55	7-627-556-38	s	SCREW, PRECISION +P 2.6X4
56	7-628-254-00	s	SCREW +PS 2.6X5
57	7-628-254-20	s	SCREW +PS 2.6X8
58	7-671-115-01	s	BALL, STEEL
59	7-682-547-04	s	SCREW +B 3X6
60	7-683-404-04	s	BOLT, HEXAGON SOCKET 3X8
61	7-683-410-04	s	BOLT, HEXAGON SOCKET 3X20
62	7-685-533-19	s	SCREW +BTP 2.6X6 TYPE2 N-S
63	7-627-553-48	s	SCREW, PRECISION +P 2X4

VF MOUNT ASSY

No.	Part No.	SP	Description
101	A-8262-361-B	o	VF MOUNT ASSY
102	2-277-457-00	s	KNOB, STOPPER
103	2-277-466-01	s	SPRING, COMPRESSION
104	3-175-752-01	o	SHAFT (A), SCREW
105	3-175-757-01	o	SLIDE UNIT (2)
106	3-175-758-02	o	SLIDE UNIT (1)
107	3-175-760-01	o	SHOE, SLIDE
108	3-176-952-02	o	SLEEVE (2)
109	3-179-361-01	s	KNOB
110	3-701-505-00	s	SET SCREW, DOUBLE POINT 3X3
111	3-710-008-02	s	HOUSING, STOPPER
112	7-624-102-04	s	STOP RING 1.5, TYPE-E
113	7-627-553-48	s	SCREW, PRECISION +P 2X4
114	7-627-556-38	s	SCREW, PRECISION +P 2.6X4
115	7-627-556-58	s	SCREW +P 2.6X5

OVERALL BLOCK

VF MOUNT ASSY



LP-61 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-642-667-12	o	PRINTED CIRCUIT BOARD, LP-61
6pcs	4-937-336-01	o	HOLDER, LED
CN1	1-506-470-11	o	CONNECTOR, 5P, MALE
CN2	1-506-468-11	o	CONNECTOR, 3P, MALE
D1	8-719-974-44	s	LED PG4553KY, GRN
D2	8-719-974-43	s	LED BR4553K, RED,
D3	8-719-974-43	s	LED BR4553K, RED,
D4	8-719-939-09	s	LED AA4553K, ORG
D5	8-719-974-43	s	LED BR4553K, RED,
D6	8-719-939-09	s	LED AA4553K, ORG
R1	1-216-802-11	s	METAL 27 0.50% 1/16W
R2	1-218-672-11	s	METAL 150 0.50% 1/16W
R3	1-218-672-11	s	METAL 150 0.50% 1/16W
R4	1-218-672-11	s	METAL 150 0.50% 1/16W
R5	1-218-672-11	s	METAL 150 0.50% 1/16W
R6	1-218-672-11	s	METAL 150 0.50% 1/16W

VF-46 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8271-197-A	o	MOUNTED CIRCUIT BOARD, VF-46
C1	1-135-210-11	s	TANTALUM, CHIP 4.7uF 10% 10V
C2	1-164-360-11	s	CERAMIC 0.1uF 16V
C3	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C4	1-164-360-11	s	CERAMIC 0.1uF 16V
C5	1-164-360-11	s	CERAMIC 0.1uF 16V
C6	1-164-360-11	s	CERAMIC 0.1uF 16V
C7	1-162-905-11	s	CERAMIC 1PF 0.25PF 50V
C8	1-162-927-11	s	CERAMIC, CHIP 100PF 5% 50V
C9	1-164-360-11	s	CERAMIC 0.1uF 16V
C10	1-164-360-11	s	CERAMIC 0.1uF 16V
C11	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C12	1-164-360-11	s	CERAMIC 0.1uF 16V
C13	1-162-918-11	s	CERAMIC, CHIP 18PF 5% 50V
C14	1-162-927-11	s	CERAMIC, CHIP 100PF 5% 50V
C15	1-124-667-11	s	ELECT 10uF 20% 100
C16	1-124-790-11	s	ELECT 0.47uF 20% 100V
C17	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C18	1-135-164-21	s	TANTALUM, CHIP 22uF 20% 10V
C19	⚠1-136-481-11	s	FILM 0.0022uF 5% 100V
C20	⚠1-136-481-11	s	FILM 0.0022uF 5% 100V
C21	1-136-187-11	s	FILM 0.047uF 5% 250V
C22	1-136-203-11	s	FILM 0.01uF 5% 630V
C23	1-136-205-11	s	FILM 0.022uF 5% 630V
C24	1-136-203-11	s	FILM 0.01uF 5% 630V
C25	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C26	1-164-360-11	s	CERAMIC 0.1uF 16V
C27	1-136-187-11	s	FILM 0.047uF 5% 250V
C28	1-135-165-11	s	TANTALUM, CHIP 33uF 10% 16V
C29	1-164-360-11	s	CERAMIC 0.1uF 16V
C30	1-124-791-11	s	ELECT 1uF 20% 50V
C31	1-162-918-11	s	CERAMIC, CHIP 18PF 5% 50V
C32	1-106-367-00	s	MYLAR 0.01uF 10% 100V
C33	1-124-791-11	s	ELECT 1uF 20% 50V
C35	1-135-216-11	s	TANTALUM, CHIP 10uF 20% 10V
C36	1-135-216-11	s	TANTALUM, CHIP 10uF 20% 10V
C37	1-162-927-11	s	CERAMIC, CHIP 100PF 5% 50V
CN1	1-506-469-11	o	CONNECTOR, 4P, MALE
CN2	1-506-474-11	o	CONNECTOR, 9P, MALE
CN3	1-506-468-11	o	CONNECTOR, 3P, MALE
CN4	1-506-468-11	o	CONNECTOR, 3P, MALE
CN5	1-506-468-11	o	CONNECTOR, 3P, MALE
CN6	1-506-469-11	o	CONNECTOR, 4P, MALE
CN7	1-506-473-11	o	CONNECTOR, 8P, MALE
D1	8-719-800-76	s	DIODE 1SS226
D3	8-719-800-76	s	DIODE 1SS226
D4	8-719-018-66	s	DIODE ES1F-N
D5	8-719-800-76	s	DIODE 1SS226
D6	8-719-900-95	s	DIODE V09G
D7	8-719-018-66	s	DIODE ES1F-N
D8	8-719-018-66	s	DIODE ES1F-N
D9	8-719-018-66	s	DIODE ES1F-N
D10	8-719-800-76	s	DIODE 1SS226
D11	8-719-800-76	s	DIODE 1SS226
D12	8-719-800-76	s	DIODE 1SS226
D13	8-719-800-76	s	DIODE 1SS226
D14	8-719-157-69	s	DIODE RD20M-B

(VF-46 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
D15	8-719-157-54	s	DIODE RD12M-B
DL1	1-415-432-11	s	DELAY LINE
DL2	1-415-430-11	s	DELAY LINE 30nS
IC1	8-759-142-20	s	IC UPC4062G2
IC2	8-759-209-57	s	IC TC4S69F
IC3	8-759-209-97	s	IC TC4S81F
IC4	8-752-054-80	s	IC CXA1521M
IC5	8-759-054-61	s	IC CLC505AJE
IC6	8-752-054-80	s	IC CXA1521M
IC7	8-759-054-61	s	IC CLC505AJE
IC8	8-759-142-20	s	IC UPC4062G2
L1	1-408-421-00	s	INDUCTOR 100uH
L2	1-460-002-11	s	COIL, LINEARITY
Q1	8-729-143-07	s	TRANSISTOR 2SA1610-Y33
Q2	8-729-143-14	s	TRANSISTOR 2SC4176-B35
Q3	8-729-143-14	s	TRANSISTOR 2SC4176-B35
Q4	8-729-140-37	s	TRANSISTOR 2SC3734-L-B24
Q5	8-729-143-07	s	TRANSISTOR 2SA1610-Y33
Q6	8-729-143-14	s	TRANSISTOR 2SC4176-B35
Q7	8-729-804-58	s	TRANSISTOR 2SC3600-E
Q8	8-729-804-63	s	TRANSISTOR 2SA1406-E
Q9	8-729-271-32	s	TRANSISTOR 2SC2713-L
Q10	8-729-271-32	s	TRANSISTOR 2SC2713-L
Q14	8-729-320-14	s	TRANSISTOR 2SK430L
Q15	8-729-320-14	s	TRANSISTOR 2SK430L
Q16	8-729-320-14	s	TRANSISTOR 2SK430L
Q17	8-729-809-35	s	TRANSISTOR 2SC4412-5
Q18	8-729-809-35	s	TRANSISTOR 2SC4412-5
Q19	8-729-143-07	s	TRANSISTOR 2SA1610-Y33
Q20	8-729-143-14	s	TRANSISTOR 2SC4176-B35
R1	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R2	1-218-668-11	s	METAL 100 0.50% 1/16W
R3	1-218-668-11	s	METAL 100 0.50% 1/16W
R4	1-216-826-11	s	METAL, CHIP 2.7K 5% 1/16W
R5	1-216-852-11	s	METAL, CHIP 390K 5% 1/16W
R6	1-218-732-11	s	METAL 47K 0.50% 1/16W
R7	1-218-720-11	s	METAL 15K 0.50% 1/16W
R8	1-218-295-11	s	METAL 5.6K 0.50% 1/16W
R9	1-218-288-11	s	METAL, CHIP 300 5% 1/16W
R10	1-218-700-11	s	METAL 2.2K 0.50% 1/16W
R11	1-218-740-11	s	METAL 100K 0.50% 1/16W
R12	1-218-296-11	s	METAL, CHIP 75K 5% 1/16W
R13	1-218-288-11	s	METAL, CHIP 300 5% 1/16W
R14	1-218-700-11	s	METAL 2.2K 0.50% 1/16W
R15	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R16	1-218-272-11	s	METAL 5.1K 0.50% 1/16W
R17	1-218-707-11	s	METAL 4.3K 0.50% 1/16W
R18	1-218-668-11	s	METAL 100 0.50% 1/16W
R19	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R20	1-218-271-11	s	METAL 2K 0.50% 1/16W
R21	1-218-736-11	s	METAL 68K 0.50% 1/16W
R22	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R23	1-218-716-11	s	METAL 10K 0.50% 1/16W
R24	1-218-668-11	s	METAL 100 0.50% 1/16W
R25	1-218-716-11	s	METAL 10K 0.50% 1/16W
R26	1-216-817-11	s	METAL, CHIP 470 5% 1/16W

(VF-46 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R27	1-218-482-11	s	METAL 430 0.50% 1/16W
R28	1-218-716-11	s	METAL 10K 0.50% 1/16W
R29	1-220-373-11	s	METAL 620 0.50% 1/16W
R30	1-216-826-11	s	METAL, CHIP 2.7K 5% 1/16W
R31	1-218-668-11	s	METAL 100 0.50% 1/16W
R32	1-216-823-11	s	METAL, CHIP 1.5K 5% 1/16W
R33	1-218-732-11	s	METAL 47K 0.50% 1/16W
R34	1-216-817-11	s	METAL, CHIP 470 5% 1/16W
R35	1-218-701-11	s	METAL 2.4K 0.50% 1/16W
R36	1-218-700-11	s	METAL 2.2K 0.50% 1/16W
R37	1-218-272-11	s	METAL 5.1K 0.50% 1/16W
R38	1-218-724-11	s	METAL 22K 0.50% 1/16W
R39	1-218-700-11	s	METAL 2.2K 0.50% 1/16W
R40	1-218-659-11	s	METAL 43 0.50% 1/16W
R41	1-216-853-11	s	METAL, CHIP 470K 5% 1/16W
R42	1-218-732-11	s	METAL 47K 0.50% 1/16W
R43	1-218-740-11	s	METAL 100K 0.50% 1/16W
R44	1-216-801-11	s	METAL 22 0.50% 1/16W
R45	1-216-801-11	s	METAL 22 0.50% 1/16W
R46	1-216-801-11	s	METAL 22 0.50% 1/16W
R47	1-218-740-11	s	METAL 100K 0.50% 1/16W
R49	1-216-121-00	s	METAL, CHIP 1M 5% 1/10W
R50	1-216-121-00	s	METAL, CHIP 1M 5% 1/10W
R51	1-216-121-00	s	METAL, CHIP 1M 5% 1/10W
R52	1-216-127-11	s	METAL 1.8M 5% 1/10W
R53	1-216-129-00	s	METAL, CHIP 2.2M 5% 1/10W
R54	1-216-842-11	s	METAL, CHIP 56K 5% 1/16W
R55	1-218-724-11	s	METAL 22K 0.50% 1/16W
R56	1-218-724-11	s	METAL 22K 0.50% 1/16W
R57	1-218-732-11	s	METAL 47K 0.50% 1/16W
R58	1-218-668-11	s	METAL 100 0.50% 1/16W
R59	1-218-716-11	s	METAL 10K 0.50% 1/16W
R60	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R61	1-218-659-11	s	METAL 43 0.50% 1/16W
R62	1-218-716-11	s	METAL 10K 0.50% 1/16W
R63	1-218-724-11	s	METAL 22K 0.50% 1/16W
R64	1-218-668-11	s	METAL 100 0.50% 1/16W
R65	1-218-733-11	s	METAL 51K 0.50% 1/16W
R66	1-218-740-11	s	METAL 100K 0.50% 1/16W
R67	1-216-830-11	s	METAL, CHIP 5.6K 5% 1/16W
R68	1-216-994-11	s	METAL, CHIP 13K 5% 1/16W
R69	1-218-295-11	s	METAL 5.6K 0.50% 1/16W
R71	1-216-795-11	s	METAL 6.8K 0.50% 1/16W
R72	1-216-801-11	s	METAL 22 0.50% 1/16W
R73	1-218-716-11	s	METAL 10K 0.50% 1/16W
R74	1-218-716-11	s	METAL 10K 0.50% 1/16W
R75	1-216-826-11	s	METAL, CHIP 2.7K 5% 1/16W
R76	1-218-716-11	s	METAL 10K 0.50% 1/16W
R77	1-218-716-11	s	METAL 10K 0.50% 1/16W
R78	1-218-716-11	s	METAL 10K 0.50% 1/16W
R79	1-218-716-11	s	METAL 10K 0.50% 1/16W
R80	1-218-706-11	s	METAL 3.9K 0.50% 1/16W
R81	1-218-672-11	s	METAL 150 0.50% 1/16W
R82	1-218-706-11	s	METAL 3.9K 0.50% 1/16W
R83	1-216-856-11	s	METAL, CHIP 820K 5% 1/16W
R84	1-216-864-11	s	METAL, CHIP 0-OHM
R86	1-218-716-11	s	METAL 10K 0.50% 1/16W
RV1	⚠1-237-036-11	s	RES, ADJ, METAL 10K

(VF-46 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
RV2	⚠1-237-030-11	s	RES, ADJ, CERMET 100
RV3	1-237-042-11	s	RES, ADJ, METAL 1M
T1	1-446-106-00	s	TRANSFORMER, HEATER PALS
T2	⚠1-439-477-11	s	TRANSFORMER, FLYBACK
TH1	1-800-198-99	s	THERMISTOR S-1K

VF-47 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8271-196-A	o	MOUNTED CIRCUIT BOARD, VF-47
C1	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C2	1-162-927-11	s	CERAMIC, CHIP 100PF 5% 50V
C3	1-162-927-11	s	CERAMIC, CHIP 100PF 5% 50V
C4	1-135-216-11	s	TANTALUM, CHIP 10uF 20% 10V
C5	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C6	1-162-927-11	s	CERAMIC, CHIP 100PF 5% 50V
C7	1-164-360-11	s	CERAMIC 0.1uF 16V
C8	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C9	1-135-216-11	s	TANTALUM, CHIP 10uF 20% 10V
C10	1-135-177-21	s	TANTALUM, CHIP 1uF 10% 25V
C11	1-162-969-11	s	CERAMIC 0.0068uF 10% 25V
C12	1-136-481-11	s	FILM 0.0022uF 5% 100V
C13	1-135-177-21	s	TANTALUM, CHIP 1uF 10% 25V
C14	1-135-177-21	s	TANTALUM, CHIP 1uF 10% 25V
C15	1-135-176-21	s	TANTAL 0.68uF 20% 20V
C16	1-162-968-11	s	CERAMIC, CHIP 0.0047uF 10% 50V
C17	1-135-216-11	s	TANTALUM, CHIP 10uF 20% 10V
C18	1-135-216-11	s	TANTALUM, CHIP 10uF 20% 10V
C19	1-162-959-11	s	CERAMIC 330PF 5% 50V
C20	1-135-216-11	s	TANTALUM, CHIP 10uF 20% 10V
C21	1-164-360-11	s	CERAMIC 0.1uF 16V
C22	1-135-092-21	s	TANTALUM, CHIP 3.3uF 10% 16V
C23	1-128-283-11	s	ELECT 100uF 20% 6.3V
C24	1-128-283-11	s	ELECT 100uF 20% 6.3V
C25	1-162-965-11	s	CERAMIC 0.0015uF 10% 50V
C26	1-124-489-11	s	ELECT 150uF 20% 25V
C27	1-135-215-21	s	TANTALUM, CHIP 6.8uF 20% 16V
C28	1-135-125-21	s	TANTALUM, CHIP 33uF 20% 10V
C29	1-162-638-11	s	CERAMIC, CHIP 1uF 16V
C30	1-164-392-11	s	CERAMIC 390PF 5% 50V
C31	1-135-216-11	s	TANTALUM, CHIP 10uF 20% 10V
C32	1-136-165-00	s	FILM 0.1uF 5% 50V
C33	1-128-299-11	s	ELECT 180uF 20% 16V
C34	1-164-360-11	s	CERAMIC 0.1uF 16V
C35	1-135-216-11	s	TANTALUM, CHIP 10uF 20% 10V
C36	1-135-216-11	s	TANTALUM, CHIP 10uF 20% 10V
C37	1-135-216-11	s	TANTALUM, CHIP 10uF 20% 10V
C38	1-128-299-11	s	ELECT 180uF 20% 16V
C39	1-164-360-11	s	CERAMIC 0.1uF 16V
C40	1-162-915-11	s	CERAMIC, CHIP 10PF 5PF 50V
CN1	1-506-481-11	o	CONNECTOR, 2P, MALE
CN2	1-506-481-31	o	PIN, CONNECTOR 2P
CN3	1-506-473-11	o	CONNECTOR, 8P, MALE
D1	8-719-025-21	s	DIODE 02CZ2.4-TE85L
D2	8-719-800-76	s	DIODE 1SS226
D3	8-719-800-76	s	DIODE 1SS226
D4	8-719-023-53	s	DIODE EA30QS04-F
D5	8-719-025-29	s	DIODE 02CZ5.1-TE85L
D6	8-719-025-77	s	DIODE TLRA160(RS)
FB1	1-543-528-11	s	BEAD, AMORPHOUS
FB2	1-543-528-11	s	BEAD, AMORPHOUS
IC1	8-759-239-34	s	IC TC74HC4538AF
IC2	⚠8-759-300-28	s	IC HA11423MP
IC3	⚠8-759-937-36	s	IC TL1451ACNS
IC4	8-759-142-20	s	IC UPC4062G2

(VF-47 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
L1	1-410-283-11	s	48uH (WITH CORE)
L2	1-412-049-11	s	CHOKE 200uH
Q1	8-729-143-07	s	TRANSISTOR 2SA1610-Y33
Q2	8-729-117-32	s	TRANSISTOR 2SC4177
Q3	8-729-117-32	s	TRANSISTOR 2SC4177
Q4	8-729-117-16	s	TRANSISTOR 2SA1611-M6
Q5	8-729-117-32	s	TRANSISTOR 2SC4177
Q6	8-729-117-32	s	TRANSISTOR 2SC4177
Q7	8-729-117-16	s	TRANSISTOR 2SA1611-M6
Q8	8-729-322-45	s	TRANSISTOR 2SJ182S
Q9	8-729-230-32	s	TRANSISTOR 2SA1244LB
Q10	8-729-117-32	s	TRANSISTOR 2SC4177
Q12	8-729-425-41	s	TRANSISTOR 2SK1374
R1	1-216-853-11	s	METAL, CHIP 470K 5% 1/16W
R2	1-218-708-11	s	METAL 4.7K 0.50% 1/16W
R3	1-218-744-11	s	METAL 150K 0.50% 1/16W
R4	1-218-716-11	s	METAL 10K 0.50% 1/16W
R5	1-218-736-11	s	METAL 68K 0.50% 1/16W
R6	1-218-716-11	s	METAL 10K 0.50% 1/16W
R7	1-218-724-11	s	METAL 22K 0.50% 1/16W
R8	1-218-668-11	s	METAL 100 0.50% 1/16W
R9	1-218-724-11	s	METAL 22K 0.50% 1/16W
R10	1-216-797-11	s	METAL, CHIP 10 5% 1/16W
R11	1-218-714-11	s	METAL 8.2K 0.50% 1/16W
R12	1-218-736-11	s	METAL 68K 0.50% 1/16W
R13	1-216-834-11	s	METAL, CHIP 12K 5% 1/16W
R14	⚠1-218-700-11	s	METAL 2.2K 0.50% 1/16W
R15	⚠1-218-883-11	s	METAL 33K 0.50% 1/16W
R16	1-216-804-11	s	METAL 39K 0.50% 1/16W
R17	1-218-668-11	s	METAL 100 0.50% 1/16W
R18	1-218-295-11	s	METAL 5.6K 0.50% 1/16W
R19	1-218-704-11	s	METAL 3.3K 0.50% 1/16W
R20	1-218-708-11	s	METAL 4.7K 0.50% 1/16W
R21	1-218-716-11	s	METAL 10K 0.50% 1/16W
R22	1-218-648-11	s	METAL 15 0.50% 1/16W
R23	1-218-700-11	s	METAL 2.2K 0.50% 1/16W
R24	1-218-704-11	s	METAL 3.3K 0.50% 1/16W
R25	1-218-708-11	s	METAL 4.7K 0.50% 1/16W
R26	1-216-793-11	s	METAL 4.7 5% 1/16W
R27	1-218-883-11	s	METAL 33K 0.50% 1/16W
R28	1-218-732-11	s	METAL 47K 0.50% 1/16W
R29	1-218-740-11	s	METAL 100K 0.50% 1/16W
R30	1-218-676-11	s	METAL 220 0.50% 1/16W
R31	1-218-313-11	s	METAL, CHIP 560 1% 1/16W
R32	1-218-648-11	s	METAL 15 0.50% 1/16W
R33	1-218-313-11	s	METAL, CHIP 560 1% 1/16W
R34	1-218-688-11	s	METAL 680 0.50% 1/16W
R35	1-218-714-11	s	METAL 8.2K 0.50% 1/16W
R36	1-216-823-11	s	METAL, CHIP 1.5K 5% 1/16W
R37	1-216-823-11	s	METAL, CHIP 1.5K 5% 1/16W
R38	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R39	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R40	1-218-723-11	s	METAL 20K 0.50% 1/16W
R41	1-218-708-11	s	METAL 4.7K 0.50% 1/16W
R42	1-218-704-11	s	METAL 3.3K 0.50% 1/16W
R43	1-218-740-11	s	METAL 100K 0.50% 1/16W
R44	1-218-740-11	s	METAL 100K 0.50% 1/16W
R45	1-218-740-11	s	METAL 100K 0.50% 1/16W

(VF-47 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R46	1-218-708-11	s	METAL 4.7K 0.50% 1/16W
R47	1-216-801-11	s	METAL 22 0.50% 1/16W
R48	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R49	1-218-295-11	s	METAL 5.6K 0.50% 1/16W
R50	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R51	⚠1-216-994-11	s	METAL, CHIP 13K 5% 1/16W
R52	⚠1-218-288-11	s	METAL, CHIP 300 5% 1/16W
R53	⚠1-218-708-11	s	METAL 4.7K 0.50% 1/16W
R54	1-220-373-11	s	METAL 620 0.50% 1/16W
R55	1-218-740-11	s	METAL 100K 0.50% 1/16W
R56	1-218-716-11	s	METAL 10K 0.50% 1/16W
R57	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R58	1-216-795-11	s	METAL 6.8K 0.50% 1/16W
R59	1-216-812-11	s	METAL, CHIP 180 5% 1/16W
RV1	1-237-035-11	s	RES, ADJ, METAL 5K
RV2	1-237-035-11	s	RES, ADJ, METAL 5K
RV3	1-237-031-11	s	RES, ADJ, METAL 200
RV4	1-237-032-11	s	RES, ADJ, METAL 500

FRAME

Ref. No. or Q'ty	Part No.	SP	Description
1pc	⚠1-451-330-21	s	DEFLECTION YOKE, VF (HD)
1pc	⚠1-464-168-22	s	MULTIPLIER
1pc	⚠1-546-077-11	s	PICTURE TUBE
1pc	1-934-936-11	s	HARNESS (CRT)
1pc	1-526-540-22	s	SOCKET, PICTURE TUBE
CN1F (to LP-61 board)			
	1-569-198-11	o	HOUSING, 5P
	1-569-194-11	o	CONTACT, FEMALE, AWG24-30
CN1F (to VF-46 board)			
	1-569-197-21	o	HOUSING, 4P
	1-569-194-11	o	CONTACT, FEMALE, AWG24-30
CN1F (to VF-47 board)			
	1-569-195-11	o	HOUSING, 2P
	1-569-194-11	o	CONTACT, FEMALE, AWG24-30
CN2F (to LP-61 board)			
	1-569-196-11	o	HOUSING, 3P
	1-569-192-11	o	CONTACT, FEMALE, AWG22-26
CN2F (to VF-46 board)			
	1-569-202-11	o	HOUSING, 9P
	1-569-192-11	o	CONTACT, FEMALE, AWG22-26
CN2F (to VF-47 board)			
	1-569-195-31	o	HOUSING, 2P
	1-569-192-11	o	CONTACT, FEMALE, AWG22-26
CN3F (to VF-46 board)			
	1-562-148-11	o	HOUSING, 3P
	1-564-026-00	o	CONTACT, FEMALE, AWG26-30
CN3F (to VF-47 board)			
	1-569-201-11	o	HOUSING, 8P
	1-569-194-11	o	CONTACT, FEMALE, AWG24-30
CN5F (to VF-46 board)			
	1-562-148-11	o	HOUSING, 3P
	1-564-026-00	o	CONTACT, FEMALE, AWG26-30
CN6F (to VF-46 board)			
	1-569-197-11	o	HOUSING, 4P
	1-569-194-11	o	CONTACT, FEMALE, AWG24-30
CN7F (to VF-46 board)			
	1-569-201-11	o	HOUSING, 8P
	1-569-194-11	o	CONTACT, FEMALE, AWG24-30
CN101	1-568-233-11	s	PLUG, CONNECTOR (ROUND) (M)12P
RV101	1-226-736-00	s	RES, VAR, CARBON 250K "BRIGHT CONT"
RV102	1-226-736-00	s	RES, VAR, CARBON 250K "CONTRAST CONT"
RV103	1-226-736-00	s	RES, VAR, CARBON 250K "PEAKING CONT"
SW101	1-554-924-11	s	SWITCH, TOGGLE (SHORT TOGGLE) "TALLY"

PACKING MATERIALS & SUPPLIED ACCESSORIES

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8262-361-B	o	VF MOUNT ASSY
3pcs	3-177-539-01	o	CLAMP, CABLE

このマニュアルに記載されている事柄の著作権は当社にあり，説明内容は機器購入者の使用を目的としています。
従って，当社の許可なしに無断で複写したり，説明内容（操作，保守等）と異なる目的で本マニュアルを使用することを禁止します。

The material contained in this manual consists of information that is the property of Sony Corporation and is intended solely for use by the purchasers of the equipment described in this manual.
Sony Corporation expressly prohibits the duplication of any portion of this manual or the use thereof for any purpose other than the operation or maintenance of the equipment described in this manual without the express written permission of Sony Corporation.

Le matériel contenu dans ce manuel consiste en informations qui sont la propriété de Sony Corporation et sont destinées exclusivement à l'usage des acquéreurs de l'équipement décrit dans ce manuel.
Sony Corporation interdit formellement la copie de quelque partie que ce soit de ce manuel ou son emploi pour tout autre but que des opérations ou entretiens de l'équipement à moins d'une permission écrite de Sony Corporation.

Das in dieser Anleitung enthaltene Material besteht aus Informationen, die Eigentum der Sony Corporation sind und ausschließlich zum Gebrauch durch den Käufer der in dieser Anleitung beschriebenen Ausrüstung bestimmt sind.
Die Sony Corporation untersagt ausdrücklich die Vervielfältigung jeglicher Teile dieser Anleitung oder den Gebrauch derselben für irgendeinen anderen Zweck als die Bedienung oder Wartung der in dieser Anleitung beschriebenen Ausrüstung ohne ausdrückliche schriftliche Erlaubnis der Sony Corporation.

HDVF-150
3-175-392-02

Sony Corporation
Camera Products Group

Printed in Japan
1992. 12 09
© 1992
Published by B & P Marketing Group